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November 1984
Volume 7, Number 11

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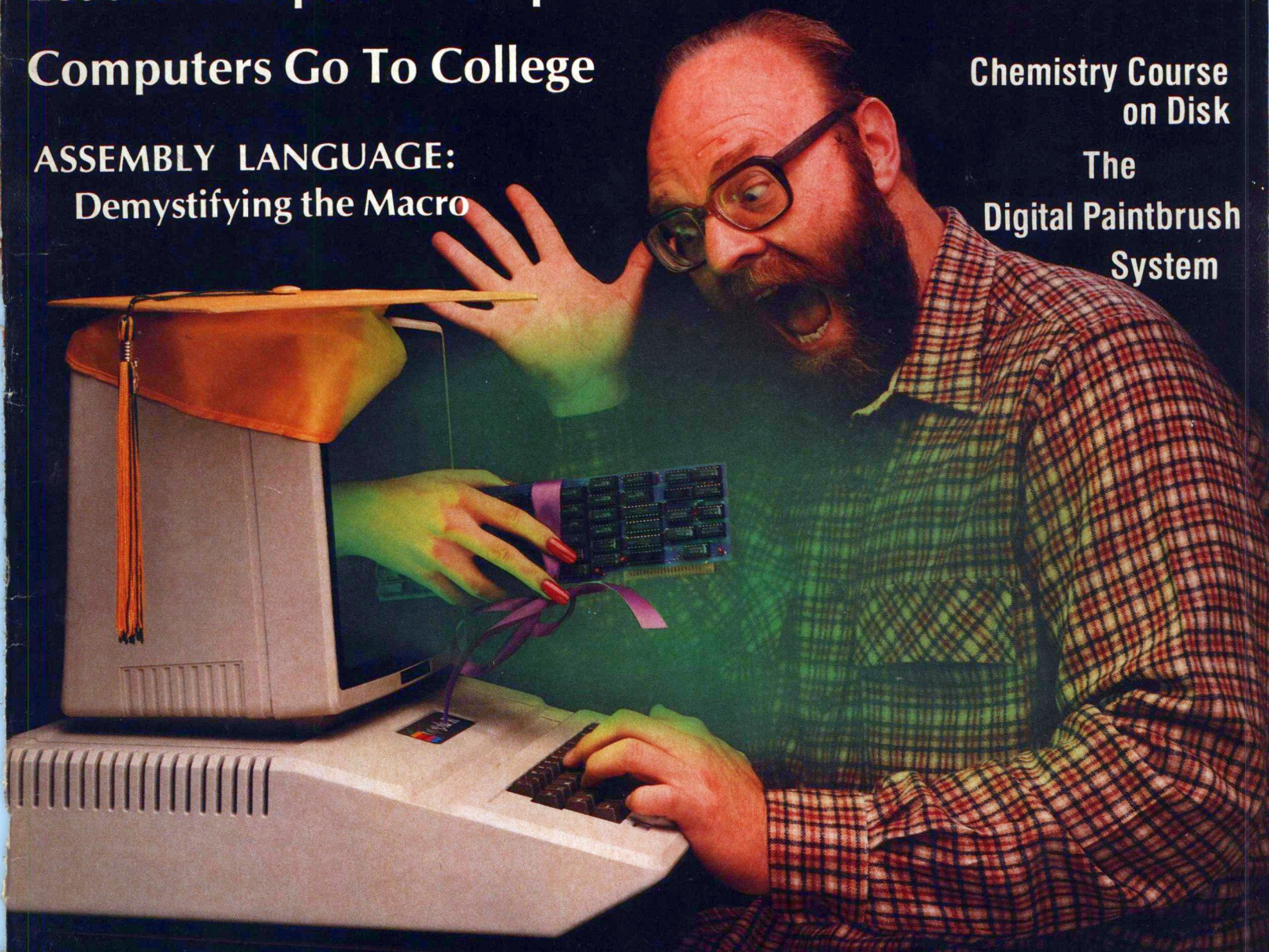

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# Call-

*Volume 7, Number 11*

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Photographed by Seattle's #1, Tim Orden, of the Photographers Rental Studio.

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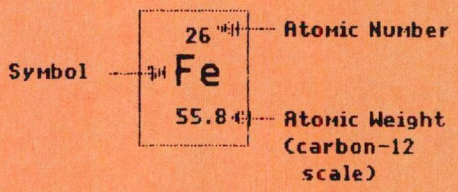


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A unique input device incorporating the best features of a light pen, a touch pad, and a mouse

## The INNER

**Don Elman**

### Come Join the Band!

The rapid spread of personal computers throughout previously-untouched areas of our lives has created an intense societal pressure to climb on the bandwagon and, at the same time, has caught many people with their "chips" down. Nowhere is this more evident than in the field of education.

Until two or three years ago, an elementary school that had its own computers would have been considered unusual—perhaps even elitist. Today just the opposite is true. School districts seem less concerned about justifying their investment in computer systems, and more worried about how to train their staffs in the new educational technology. We still haven't seen the "disk pack" replace the book bag as a staple in the student's wardrobe, nor has keyboarding supplanted penmanship as a basic skill—but that turning point may not be far off.

At our colleges and universities, which have been traditional bastions of mainframes, microcomputers are sprouting up like dandelions. Some schools even require incoming students to purchase or rent them. Yet there is still a long way to go before computerized

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Apple PugetSound Program Library Exchange

November 1984


## CIRCUIT

instruction becomes an integral part of the standard curriculum.

### In This Issue

Our contribution to the educational-computing revolution this month ranges from software tips to instructional techniques and objectives. Ellis McDaniels, in **Let the Computer Compute!**, explains how to allow a student access to the computer's calculating power while running an interactive math lesson. For more advanced programmers, we present a clearly-written tutorial on an important aspect of assembly language (**Demystifying the Macro**, by Steven Meuse). Our regular contributor, Jeffrey Jacques, gives his viewpoint about how best to implement computers in higher education.

Learning about, and with, computers has always been one of **Call -A.P.P.L.E.**'s fundamental goals. To get a flavor of current, commercial software in education, read Lee Webster's review of a comprehensive science course on disk, **Learning General Chemistry**. Finally, don't overlook Larry Neibauer's review of a unique input device (**Digital Paintbrush**), as well as our many regular columns and departments.

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# Let the Computer Compute!

**Ellis McDaniels**

YOU have heard of left-brain and right-brain? Well, I have something different-an up-brain and a down-brain. I am both an educator and a hacker, and I am proud of both parts of my personality.

Most of my educational software is still stored between my ears and, despite hours at the Apple II+ keyboard, most of my hacker software is there too. You see, I am busy trying to produce integrated products—programs that integrate the educator and the hacker within me. Luckily, each side of me is quite clear about its own motivation for using a computer—each one wants *to make the Apple do what I want it to do* and each knows that, at bottom, I am a human being first of all.

The typical educational program presumes that education is concerned with "what" and not with "how." Maybe it is in some fields, fields that are more product oriented and less process oriented than math. Nevertheless, as a math teacher, I try to emphasize problem-solving instead of answer-getting.

As an example of what I don't like, type in the program KEWPIE DOLL from Listing 1. SAVE it on disk or tape because the revisions I am going to suggest require just a few more lines.

RUN it and try to win some kewpie dolls.

## Behind the Program

First, some comments. The educational objectives of such a program would be something like this:

(1) the student should be able to recognize a right triangle given its three sides.
(2) the student should be able to identify which side is the hypotenuse (the longest side) and which sides are the legs.
(3) the student should be able to recognize that the area of a right triangle is equal to half the product of the legs.
(4) the student should be able to find half the product of the legs somehow (but, let's be reasonable about this—we don't expect the student to be a "lightning calculator".)

There is some error-checking built into the program. The sides (and area) are forced to be integers so that the answer is not subject to round-off errors. Line 50010 makes sure that none of the calculations overflow into scientific notation. The INPUT is received into a string (not numeric) variable to prevent program bombing through typos.

As you can see, I wrote this demo in at least a semi-serious frame of both minds.

## Then, What Is Wrong With It?

If you have already won, or lost, a kewpie doll or two, you know that the program itself did not help you find the answer. The question sat there on the screen waiting for you to run around after a calculator, a paper-and-pencil, an abacus, or something, to actually compute the answer. It tested the availability of supplies just as much as it tested your application of knowledge about right triangles. And, it put a big strain on your ability to compute without a computer!

The Apple is a super calculator—among other things. *Why not let the computer compute?* Well, you are stuck in the program, and the program does not have the elementary intelligence to add 2 and 2! So, you are forced to solve your problem by other means and hope the stupid program accepts your answer.

My own experience is that the motivation of such a situation is quite negative, and we don't need any more negative motivation in mathematics!

To my educator self the problem, properly expressed, solves itself. The student has to be able to get out of this stupid program, use the computer to compute, figure out the answer, and then get back into the program to check the answer (and settle the kewpie doll transaction). Thus, the problem is solved . . . or is it?

## Implementation

Does my hacker self know how to implement this solution? Well, methods for leaving a BASIC program, executing immediate commands, and returning to the program have been presented by C. Dorman and by Ken Kashmarek in previous issues of *Call -A.P.P.L.E.*

Kashmarek's simple solution, using only the BASIC commands STOP and CONT, can be applied easily by entering the following line into KEWPIE DOLL:

```
90 PRINT "TYPE 'CONT' WHEN YOU HAVE YOUR ANSWER.": STOP
```

But it isn't much fun. That darn error message, which you are supposed to ignore, comes with an awful beep to make sure you don't ignore it. If you are still thinking about right triangles after that assault on your two most discriminating senses, then you have more mental discipline than I!

So, let's use the END command instead of the STOP command. In other words, change line 90 to the following:

```
90 PRINT "TYPE 'CONT' WHEN YOU HAVE YOUR ANSWER.": END
```

Try winning some kewpie dolls with this version (which I call KEWPIE DOLL +). I think you will find that it has, at last, become fun (albeit, monotonous as long as it is set

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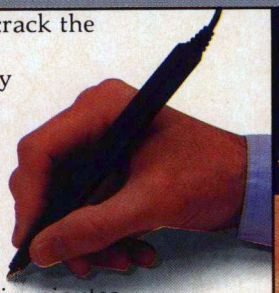

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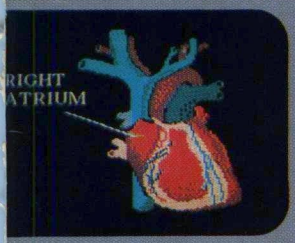

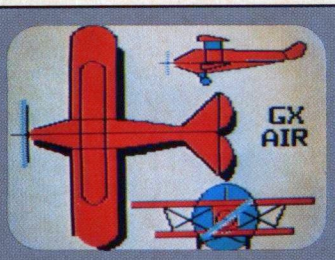

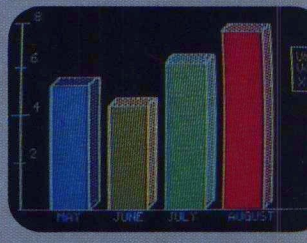

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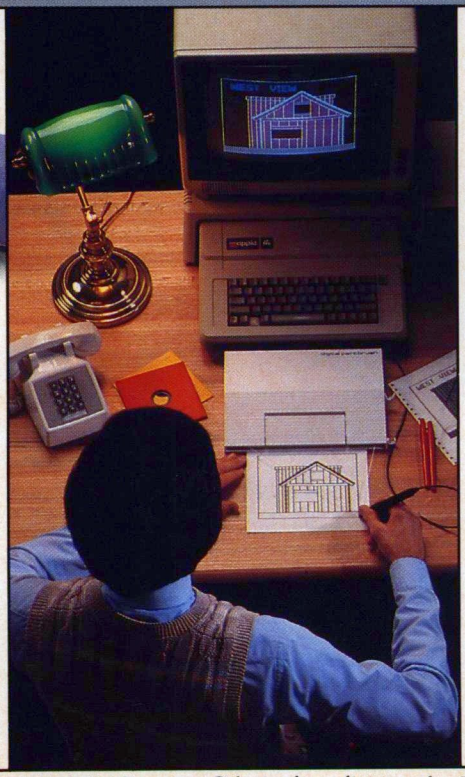

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for right triangles—but, the program is just a demo.) How about it, educator and hacker, are you integrated yet? No?

Educator: "This technique is a step in the right direction. I have students, and even classes, that I could safely use it with—but, not many. It is elementary, using only BASIC in an efficient way, and a colleague of mine is experimenting with using the technique on a non-(sigh)-Apple. Still, it allows students too much freedom, freedom that many of them cannot handle."

## Putting It To Use

Listing 2 shows a run that illustrates some of the capabilities of the technique.

The student has been practicing for a while. Finally, he enters a PR#1 command just before exiting immediate mode with a CONT so that further exercises can be recorded on the printer. This ability to turn the printer on and off is a plus, but along with it goes the dangerous ability to access any other slot—perhaps hanging the program with an empty slot or rebooting the disk.

The first problem whose complete solution is shown illustrates the use of REMs to document mathematical steps (mathematics has to be documented just as much as computer programs!) This is a unique use for REM in immediate mode!

Testing with IF-THEN and boolean expressions are both available to the students, increasing their power to compute.

But, a SYNTAX ERROR is still a pain. After an error of any sort CONT won't CONT. The solution is to reenter the program with a GOTO to a line number that will re-execute the END statement without changing any variables (and, hence, without changing the problem the student is working on, or the score he has attained). For this demo, I'd suggest

```
GOTO 40
```

since it restates the problem, allowing the student to refocus on it and forget the error.

## Implications for Educational Computing

The half-way intelligent student can be easily forgiven for expecting an "educational" program to be also half-way intelligent. It is disconcerting to realize that when just turned on with no program running, the machine is more intelligent than it is during the middle of a program when it has paused for an answer. The student suddenly presented with a need to compute gets no help with computing.

Since educators seldom know how to write programs with any degree of intelligence they are limited to the dullest of routines which drill and test only the most elementary faculty of immediate recall. Complex problems, advanced material, and problem-solving procedures are almost entirely ignored in the bulk of so-called "educational" programs.

A fabulous amount of literature has devoted itself to "idiot-proofing", "bomb-proofing" and "error-trapping." Getting commas and colons into the INPUT is important, getting the correct answer seemingly less so. Many techniques are available for scoring a simple response, few techniques exist for even producing a more complicated one.

### Listing 1. Kewpie Doll

```
]LIST

10  HOME : GOSUB 50000
20 SIZE =  INT (BIG *  RND (1))
30 SA = X * SIZE:SB = Y * SIZE:SC
     = Z * SIZE
40  PRINT "SA = "SA
50  PRINT "SB = "SB
60  PRINT "SC = "SC
70  PRINT "SA, SB & SC ARE THE SI
    DES OF A TRIANGLE.WHAT IS IT
    S AREA?"
80  PRINT
90 ::::::::::
100  INPUT "AREA = ";ANSWER$
110 ANSWER =  VAL (ANSWER$)
120  PRINT
130  IF 2 * ANSWER <  > SA * SB THEN
    180
140  PRINT "RIGHT.  YOU EARNED A
    KEWPIE DOLL."
150 KD = KD + 1
160  GOSUB 40000
170  GOTO 20
180  PRINT "WRONG.  YOU LOST A KE
    WPIE DOLL."
190 KD = KD - 1
200  GOSUB 40000
210  GOTO 30
40000  PRINT
40010 TRIES = TRIES + 1
40020  PRINT "YOU HAVE "KD" KEWPI
    E DOLLS OUT OF "TRIES
40030  PRINT "THAT IS " INT (100 *
    KD / TRIES)" PER CENT."
40040  CALL  - 756: REM WAIT FOR
    A KEYSTROKE
40050  PRINT : PRINT : PRINT
40060  RETURN
50000 X = 3:Y = 4:Z = 5
50010 BIG =  INT ( SQR (999999999
    / (Z * Z)))
50020  RETURN

]
```

**Listing 2. Kewpie Doll+ In Action**

```
]CONT
AREA = 71829600

RIGHT.  YOU EARNED A KEWPIE DOLL.

YOU HAVE 7 KEWPIE DOLLS OUT OF 9
THAT IS 77 PER CENT.


SA = 15219
SB = 20292
SC = 25365
SA, SB & SC ARE THE SIDES OF A
TRIANGLE.
WHAT IS ITS AREA?

TYPE 'CONT' WHEN YOU HAVE YOUR ANSWER.

]REM MUST TEST TO SEE IF IT IS A RIGHT
TRIANGLE.

]IF SA*SA + SB*SB = SC*SC THEN ?"IT IS A
RIGHT TRIANGLE."
IT IS A RIGHT TRIANGLE.

]REM THEREFORE, ITS AREA IS HALF THE
PRODUCT OF ITS LEGS

]REM ITS LEGS ARE SA AND SB SINCE SC IS
THE LONGEST SIDE.

]?SA*SB/2:REM COMPUTE THE AREA.
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]REM I COULD SHORTEN THIS WHOLE THING TO
THE FOLLOWING:

]IF SA*SA + SB*SB = SC*SC THEN
?SA*SB/2:CONT
154411974
AREA = 154411974

RIGHT.  YOU EARNED A KEWPIE DOLL.

YOU HAVE 8 KEWPIE DOLLS OUT OF 10
THAT IS 80 PER CENT.


SA = 15444
SB = 20592
SC = 25740
SA, SB & SC ARE THE SIDES OF A
TRIANGLE.
WHAT IS ITS AREA?

TYPE 'CONT' WHEN YOU HAVE YOUR ANSWER.
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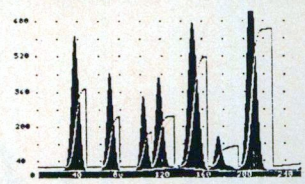

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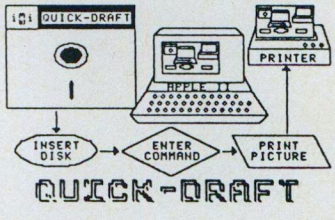


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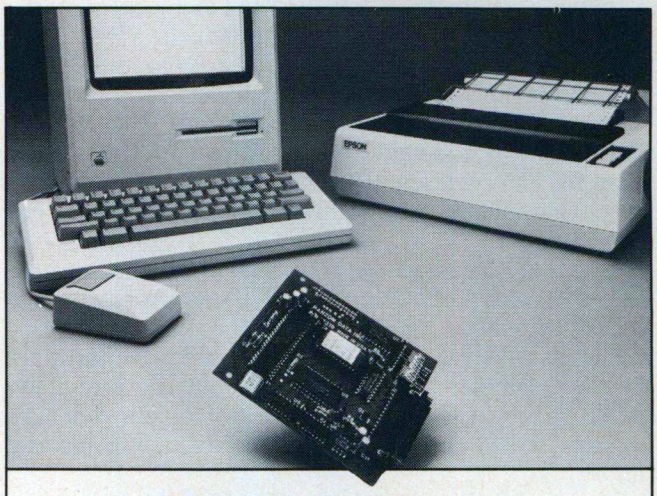

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# Demystifying the Macro

**Steven Meuse**

OWNERS of the Big Mac (a.k.a. Merlin) assembler are fortunate indeed. Where else can you find such a powerful assembler for for the Apple II family at such a ridiculously low price? If you're like me you bought Big Mac or Merlin, learned the new commands, and put the manual away for emergencies. That chapter on macros looked interesting, but was rather heavy reading. Maybe some other time...

The aim of this article is to show what macros are, what they can do, and how using them can save a fair amount of tedious, repetitive programming work when writing in assembly language. I'll be using the Big Mac/Merlin assembler as a focal point, but the principles should be the same for most macro assemblers. You may be surprised at just how easy (and even fun) macros can be!

If assembly language isn't your thing, I sympathize. When I bought my Apple, the last thing I wanted to do was "learn machine language." But, finding no other way to make music, and with the help of a good book or two, I did (reluctantly at first) take the plunge. By the time I was done, I was surprised at how uncomplicated assembly really is. If you've been toying with the idea of learning assembly language, take heart. Once you pick it up, you may never think BASIC is easy again.

## What Is A Macro?

A macro is a named block of assembly language statements which can be inserted repeatedly into your assembly language program with a single statement. Consider the following analogy:

You've invented a robot chef, and you're teaching it to make lunch. Every day, at noon, you give the robot these commands:

```
GET 2 SLICES OF WHITE BREAD
GET 1 SLICE OF BOLOGNA
GET 1 SLICE OF MUENSTER CHEESE
GET 1 PLATE

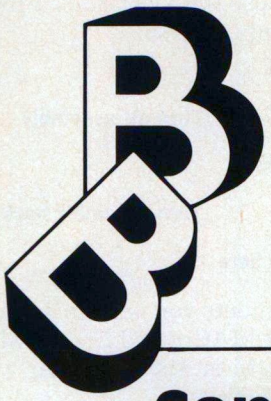
PUT PLATE ON TABLE
PUT FIRST SLICE OF BREAD ON PLATE
PUT BOLOGNA ON FIRST SLICE OF BREAD
PUT MUENSTER CHEESE ON BOLOGNA
PUT SECOND SLICE OF BREAD ON PLATE
```

As lunch is usually a daily event, this repetition soon becomes tiresome. What your robot needs is some sort of macro capability. Then you could give a name to the above sequence of tasks, and the robot could store that sequence. From then on, you would only need give the name of that group of instructions to the robot, which would then recall and execute each one in turn. If you are particularly hungry on a given day, you only need say the name (how about "SANDWICH") twice.

Although there's more to it, it basically boils down to this: A macro gives you the ability to represent a series of statements with a single word, so that you need only use the macro's name each time you need that block of statements in your program.

## How To Write A Macro

Let's start with a very simple macro. First off, in nearly all cases of macro definitions, the assembler must be told not to actually assemble the macro during definition. It is possible to invoke a macro for the first time and define it simultaneously, but there are several limitations, and it is beyond our scope at this point.



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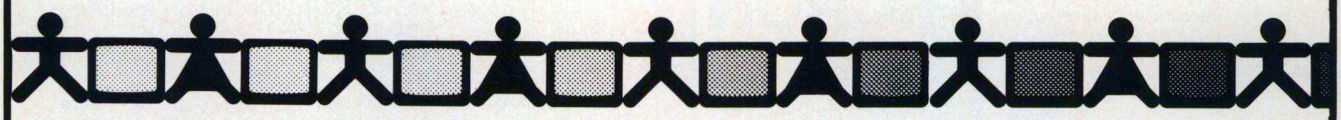

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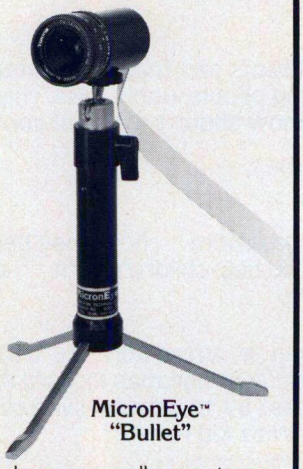

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# Education

To tell the assembler to suspend assembly for one or more macro definitions, use the "DO 0 . . . FIN" conditional assembly statements, like so:

```
1 * A Macro Definition
2
3             DO 0            ;Turn off assembly
4
5 * Definition goes here
6
7             FIN             ;Turn assembly back on again
8
9 * Start your program here
```

The other two statements you need to define a macro are MAC and EOM, for MACro and End Of Macro. The alternate syntax for EOM is <<<. Either way works the same. Here's an example:

```
1 * Another Macro Definition
2
3             DO 0            ;Turn off assembly
4
5 ERROR       MAC             ;Give the macro a name
6             LDA #$88        ;ASCII code for control-G
7             JSR COUT        ;Print it to screen (causes a beep)
8             JSR COUT        ;Again
9             JSR COUT        ;One more time
10            <<<             ;End of Macro
11
12            FIN             ;Turn assembly back on
13
14 * Remainder of program
```

You can also give the EOM or <<< opcode a label if you wish, so that you can branch to it. Like so:

```
1 * Yet another Macro Definition
2
3             DO 0            ;Assembly off
4
5 ERROR       MAC             ;Name the macro
6             LDA #$88
7             LDY #$04
8 ERROR1      DEY             ;count down
9             BEQ FINISH      ;If Y=0 then exit
10            JSR COUT        ;beep the speaker
11            JMP ERROR1      ;go back for another
12 FINISH     <<<             ;end of macro
13
14            FIN             ;Assembly back on
15
16 * Continue the program here...
```

The ERROR macro could be used in your programs whenever you needed to beep the speaker three times to indicate that the program's user has made a mistake. To use the macro in your program, you would use the command PMC for Put MaCro. Like EOM, PMC has an alternate usage, which is >>> . Here's an example of how to invoke the ERROR macro later on in the program we've started above.

```
51            LDA DATA1       ;Get first data byte
52 CHECK      CMP #$80        ;Is this value to low?
53            BGE OKAY        ;No, it's ok
54            >>> ERROR       ;Oh, no! It's too low!
55            LDA #$80
56            STA DATA1       ;Set DATA1 to our "minimum"
                              value
57 OKAY       LDA DATA2       ;Get second data byte
58            CMP #$80        ;check this byte, too
59            BGE DONE        ;A winner!
60            >>> ERROR       ;Whoops! Beep the speaker...
61            LDA #$80
```

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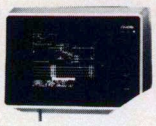

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```
62          STA DATA2    ;Set DATA2 to our "minimum"
                         number
63 DONE     RTS          ;Finished checking data
```

When you assemble this program, each time the assembler finds a " >>> ERROR" statement it will insert the block of instructions it finds in your ERROR macro definition. You've saved yourself time, and space in your source code!

At this point you may be saying, "Big Deal. I can do all that in a subroutine, and save more space to boot!" Know what? You're right! If that's all there was to macros, they'd be pretty useless. However, there's one other feature that macros have that you should know about.

## How "Macro Variables" Make The Difference

Consider our short-order cook/robot again, and the "macro" which told him how to make a bologna and cheese sandwich. It would be so much more useful if we could "pass" additional information along with the "SANDWICH" macro that could be useful in making the sandwiches. Something like

```
SANDWICH.WHEAT;PASTRAMI;MOZZARELLA
```

certainly has a lot of varied possibilities, once we rewrite the macro to accept the additional data:

```
GET 2 SLICES OF ]1) BREAD
GET 1 SLICE OF ]2)
GET 1 SLICE OF ]3) CHEESE
GET 1 PLATE
```

. . . and so on. Okay, so it's a good idea, but how can Big Mac do something like that?

The Big Mac assembler provides for special labels that begin with the right square bracket (]). These are called variables, as they can be used over and over, and hold a new value every time they are equated or used as a label. In addition, there are 8 special variables predefined especially for use with macros. They are ]1, ]2, ]3, ]4, ]5, ]6, ]7, and ]8.

These macro variables are given their value from a special usage of the PMC ( >>> ) statement. To use the macro variables, follow the macro name with a period, and then follow that with values you wish to pass to the macro, separated by colons. The assembler will pick up those values in the predefined macro variables (starting with ]1 and working toward ]8), and plug then into the macro when it generates your program.

Here's your standard, run-of-the-mill printing subroutine:

```
100 PRINTER LDY #0
101 GET     LDA ($0),Y   ;get the string pointed to by $0,$1
102         BEQ GOT      ;If this byte = 0, we're done
103         JSR COUT     ;Otherwise, print this character
104         INY          ;Point to next character
105         JMP GET      ;Go get next character
106 GOT     RTS          ;Return to caller
```

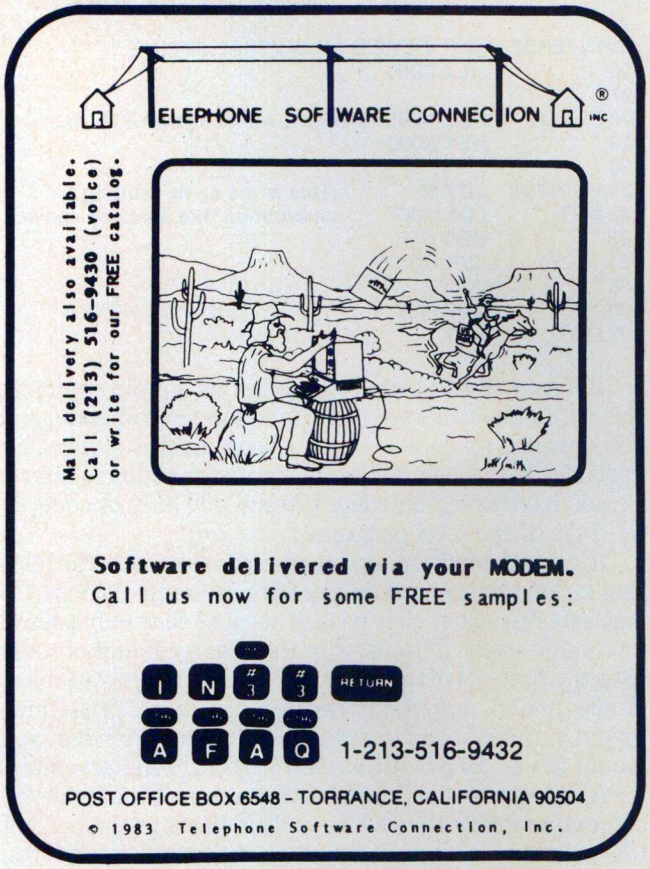
To use it, you would place a marker at the end of your string (zero in this case), put the low byte of the string's address in $0, the high byte of the string's address in $1, and JSR PRINTER. Like this:

```
70          LDA #<       ;Get low byte of string
            STRING       location
```

```
71              STA $0          ;Put it in $0
72              LDA #>          ;Get high byte of string
                STRING          location
73              STA $1          ;Put it in $1
74              JSR PRINTER
                ----------------------------------------
98 STRING       ASC "THIS IS A TEST STRING"
99              HEX 8D00        ;A return char and marker
```

Not long ago I wrote a rather lengthy program which used about 40 strings and this subroutine. Unfortunately, I had not yet learned about macros, so I ended up typing the above five lines 40 or 50 times, each time using a different label for the value of STRING. Here's how macros do it now:

```
1 * Printing using macros demo
2
3               DO 0            ;Assembly off
4
5 PRINT         MAC
6               LDA #<]1        ;Get lo byte of passed value
7               STA $0          ;Put it in $0
8               LDA #>]1        ;Get high byte of passed value
9               STA $1          ;Put it in $1
10              JSR PRINTER     ;Go and print it
11              <<<             ;End of Macro
12
13              FIN             ;Assembly back on again.
14 COUT         = $FDED         ;Location of COUT
15              ORG $800
16
17              >>> PRINT.NORMAL
18              >>> PRINT.INVERSE
19              >>> PRINT.FLASH
20              RTS             ;Return to BASIC
21
22 NORMAL       ASC "HERE'S A NORMAL STRING,"
```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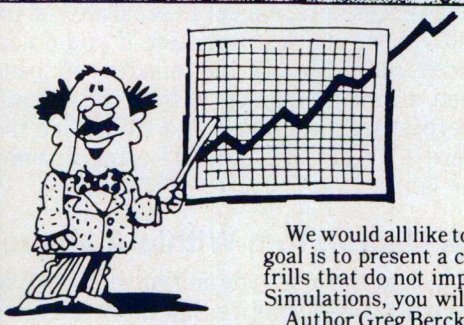

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```
23              HEX 8D00        ;carriage return and marker
24
25 INVERSE      INV "HERE'S AN INVERSE STRING,"
26              HEX 8D00
27
28 FLASH        FLS "AND FINALLY, A FLASHING STRING."
29              HEX 8D00
30
31 PRINTER      LDY #0          ;This is the same printing
32 GET          LDA ($0),Y      ;subroutine that we used above.
33              BEQ GOT
34              JSR COUT
35              INY
36              JMP GET
37 GOT          RTS
```

It's easy to see that, even with this simple example, this technique can save both time and lines of code, and can enhance readability. Had I used macros and macro variables in this way for the program I mentioned above, I could have saved between 160 and 200 lines of code, or 11–14% of the total program!

It's worth mentioning, for clarity's sake, that the lines that called the macro didn't need to use semi-colons (;) to separate the values they passed because they only passed one value each. That is why the macro definition only uses the first (]1) of the eight predefined macro variables. If the macro definition were to use more predefined macro variables than the calling statement provided, you would get a "BAD OPERAND" error during assembly.

Also, you are not limited in the number of macros you can define inside the DO 0 . . . FIN block at the head of the program. You can define as many macros as you wish, as long as you do so before they are used in your program, or else you will get a "NOT MACRO" error during assembly.

Finally, this is a true application for a macro. There is no way to represent this program in smaller or simpler form through the use of subroutines, self-modifying code, or any other tricks that I can think of. Each time the macro is used, it is given a new, unique value to generate code with.

Let's face it, these macro things is useful! But there is more!

## Even More Macro Variables

The following examples are based on the monitor MOVE routine at $FE2C. If you've ever used the monitor MOVE command (as in 4000<2000.2FFF M) then you've called this routine. Briefly, this is what it does: The MOVE routine takes three two-byte pointers: the source start address, the source end address, and the target start address. When you set up these data in the proper zero page locations, load the Y register with a zero, and call the MOVE routine, it will copy the contents of the source range of memory into the target range of memory, then return.

Let's take a look at a macro that accepts more than one value from its caller:

```
1 * MOVER
2
3 A1            = $3C           ;Pointer- source start
4 A2            = $3E           ;Pointer- source end
5 A4            = $42           ;Pointer- target start
6 MOVER         = $FE2C         ;move subroutine
7 BOTTOM        = $2000         ;example source start
8 TOP           = $3FFF         ;example source end
9 DEST          = $4000         ;example target start
10
11              DO 0
12
13 MOVE MAC ;This sets up the call to MOVER
14              LDA #>]1        ;take hi byte of value passed
15              STA A1+1        ;put it into pointer+1
16              LDY #<]1        ;take lo byte of value passed
17              STY A1          ;put it into pointer
18              LDA #>]2        ;Do the same for the second value
19              STA A2+1        ;passed to MOVE
20              LDY #<]2
21              STY A2
22              LDA #>]3        ;And finally for the last value
23              STA A4+1
24              LDY #<]3
25              STY A4
26              LDY #0          ;Set up for and
27              JSR MOVER       ;call monitor move routine.
28              <<<
29
30              FIN
31
32              ORG $800
33
34              >>> MOVE.BOTTOM;TOP;DEST
35              >>> MOVE.$F800;$FFFF;$6000
36              RTS             ;return to BASIC
```

So, each time the MOVE macro is called from this program, it will place the first value passed into ]1, the second into ]2, the third into ]3. Then it will generate the code needed to put those three values into A1, A2, and A3, and finish by producing code to call the mover routine.

Notice the form that the macro calls take. There are no spaces, only the macro name, a period, and the values to be passed separated by semi-colons. Big Mac does not allow extra spaces here, except to separate out your comment field. There is a warning here if you do comment your macro calls: Should the macro call pass fewer values than the macro expects to find, the assembler will try to interpret your comment as a value, find the space, and declare a "BAD OPERAND" error. It may not be worth the bother.

## Using A Macro From Within A Macro

If you look at the macro definition of MOVE for a moment, you will probably notice that there is a fair amount of repetition in it; the main body of the macro concerns itself with placing 3 different values into 3 different pointers, each time using an identical series of instructions. This kind of repetition is just the type of thing that macros are useful for.

Fortunately, it is legal to "nest" macros, up to 15 levels deep. Put a different way, you can use a previously defined macro as part of the definition of a new macro. What the MOVE macro needs is a macro it can call that will put a 2-byte value (or word, such as an address) into a 2-byte pointer. This would be similar to the BASIC POKE statement, except that it would generate code to poke both bytes of a word into a pointer instead of just one byte. How about something like >>> POKEWORD.ADDRESS;VALUE where the POKEWORD macro will produce code to take the low and high bytes of VALUE and put them into ADDRESS and ADDRESS +1, respectively? Here's how it might work:

Ad Number 181

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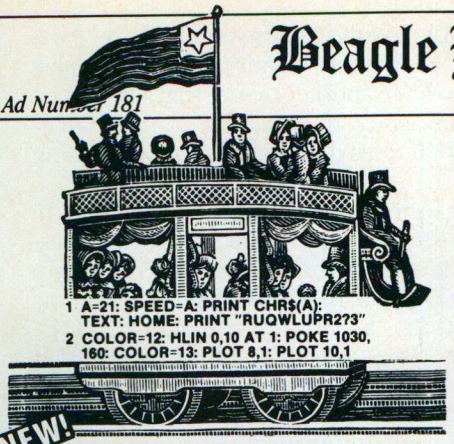


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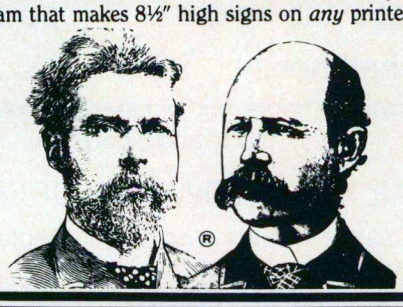

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```
 1 * MOVER
 2
 3 A1          = $3C          ;Pointer- source start
 4 A2          = $3E          ;Pointer- source end
 5 A4          = $42          ;Pointer- target start
 6 MOVER       = $FE2C        ;move subroutine
 7 BOTTOM      = $2000        ;example source start
 8 TOP         = $3FFF        ;example source end
 9 DEST        = $4000        ;example target start
10
11             DO 0
12
13 * POKE WORD MACRO
14
15 POKEWORD MAC
16             LDA #>]2       ;take hi byte of value passed
17             STA ]1 + 1     ;put it into pointer passed + 1
18             LDY #<]2       ;take lo byte of value passed
19             STY ]1         ;put it into pointer passed
20             <<<
21
22 MOVE MAC ;This sets up the call to MOVER
23             >>> POKEWORD.A1;]1 ;Use POKEWORD macro
                                  to put
24             >>> POKEWORD.A2;]2 ; first, second, and third
25             >>> POKEWORD.A4;]3 ;values passed into A1,
26             LDY #0         ;A2 and A4. Setup for and
27             JSR MOVER      ;call monitor move routine.
28             <<<
29
30             FIN
31
32             ORG $800
33
34             >>> MOVE.BOTTOM;TOP;DEST
35             >>> MOVE.$F800;$FFFF;$6000
36             RTS            ;return to BASIC
```

There are a few fine points to take note of here. First is that in addition to having cleaner, more readable source code, you also have another macro that you can invoke from the main body of your program. POKEWORD's use in MOVE does not exclude you from using it yourself.

Second, note the form that the passed values take. In the first use of the MOVE macro, the variables are assigned values from labels. In the second, the values are given as numbers. Both of these are legal, as well as other forms such as >>> MOVE.TOP;BOTTOM;($0),Y or >>> MOVE.TABLE1,X;TABLE 2,X;$1234.

Finally, note the re-use of the predefined macro variables in the macro definitions. Don't make the mistake of thinking of these as BASIC subroutines, and one just calls the other. The values ]1 and ]2 in POKEWORD are set by whatever calls POKEWORD, whether the caller is your main program or another macro or macros. What this means is that within each individual macro definition the special macro variables ]1 through ]8 are local variables, and are not affected by their internal usage by another, calling macro.

This may be a bit confusing, so let's trace what happens when Big Mac assembles the first >>> statement in this program. Line 34 sets ]1 equal to BOTTOM, ]2 equal to TOP, ]3 equal to DEST, and invokes the MOVE macro. The first statement of MOVE tells POKEWORD that ]1 is equal to A1, and ]2 is equal to what MOVE will refer to as ]1, in this case BOTTOM. POKEWORD is then called, which puts the two-byte value of BOTTOM


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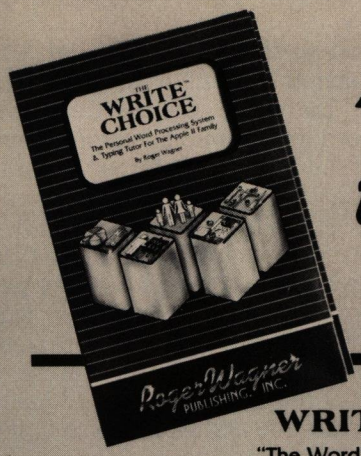
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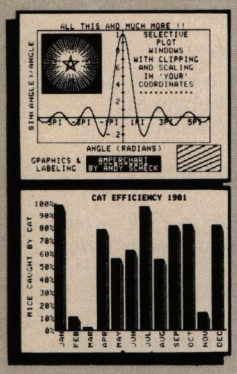
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into the pointer pair at A1, and ends. The next statement in MOVE gives POKEWORD two new values to use as ]1 and ]2, while still retaining its own values for its internal ]1, ]2 and ]3. In this case, MOVE passes A2 as POKEWORD's ]1, and TOP for POKEWORD's ]2, and invokes POKEWORD. As before, POKEWORD generates the necessary code to place the value of TOP into the pointer at A2, and ends.

MOVE calls POKEWORD one more time, passing A4 and MOVE's value for ]3 (which is DEST) as POKEWORD's values for ]1 and ]2. POKEWORD behaves as expected, and again generates code to place the number DEST into the pointer pair at location A4 and ends. In finishing up, MOVE generates the code to load the Y register with a zero (as required by the monitor move routine) and then to perform the actual subroutine call.

## How To Write An "Intelligent" Macro

If you have followed along up to this point, and have understood as well, then you have what you need to make good use of macros in your assembly language programming with Big Mac or Merlin. Should you find this next section confusing, don't worry. Do read the final section, "How To Put Macros To Use For You" if you decide to skip this one.

Conditional Assembly. (I can hear the moans from here!) Yes, you can use the conditionals DO, ELSE, and FIN within your macro definitions. As it turned out, they came in handy in refining the MOVE macro. Here's why:

Take a typical memory move, for instance moving the contents of hi-res page 1 to a storage area. The syntax for our MOVE macro would be >>> MOVE.$2000;$4000;$6000. The actual code that the MOVE macro would generate would be:

```
LDA #$20
STA A1+1
LDY #$00
STY A1

LDA #$40
STA A2+1
LDY #$00
STY A2

LDA #$60
STA A4+1
LDY #$00
STY A4
```

. . . and so on. Notice that for each call to POKEWORD the Y register is loaded with a zero. The result is that this MOVE macro will, under some conditions, produce unnecessary code. In an application where speed or size of program is critical, this macro could be useless.

The answer to this problem is to write an "intelligent" macro. That is, a macro that can detect redundancies in the values it receives, and conditionally assemble only those statements that are truly necessary. In order to do this, several other features of the Big Mac assembler must be brought to bear: First, of course, are the conditional assembly statements DO, ELSE, and FIN. Second are the normal (non-predefined) variables that Big Mac allows, namely any label beginning with a ]. Finally are the math and logical operators. In this case, only "&" (logical AND) and "/" (division) will be needed to separate the high and low bytes of the passed values into different variables.

One other twist to the final version of MOVE: In order to get maximum benefit from the redundancy-checking scheme, the order that the three values are handled is changed from source bottom, source top, target bottom, to source bottom, target bottom, source top. This is based on the assumption that most moves are made in multiples of 256 bytes (i.e., in memory page increments). An example of this is >>> MOVE.$2000;$2FFF;$4000, in which the contents of hi-res page 1 are moved to hi-res page 2. If handled as given, ($20-$2F-$40 and $00-$FF-$00) there are no repeated values among the high bytes or the low bytes in these three addresses. However, if the macro processes $2000, $4000, and then $2FFF ($20-$40-$2F and $00-$00,$FF), then the macro need only load the Y register with a zero once for $2000, and then can skip the load and go right to the store when handling $4000.

Here goes:

```
 1 * MOVER
 2
 3 A1          = $3C
 4 A2          = $3E
 5 A4          = $42
 6 MOVER       = $FE2C
 7
 8             DO 0
 9
10 POKEWORD MAC
11             LDA #>]2
12             STA ]1+1
13             LDY #<]2
14             STY ]1
15             <<<
16
17 MOVE MAC
18             >>> POKEWORD.A1
19 ]LO1        = ]1&$FF        ;get lo byte of ]1
20 ]HI1        = ]1/$100       ;get hi byte of ]1
21 ]LO2        = ]2&$FF        ;do the same for ]2
22 ]HI2        = ]2/$100
23 ]LO3        = ]3&$FF        ;and then for ]3
24 ]HI3        = ]3/$100
25             DO ]HI1-]HI3    ;is last hi byte = next?
26             LDA #>]3        ;no, get next hi byte
27             FIN
28             STA A4+1        ;either way— store it
29             DO ]LO1-]LO3    ;is last lo byte = next?
30             LDY #<]3        ;no, get next lo byte
31             FIN
32             STY A4          store it
33             DO ]HI3-]HI2    ;again— compare hi bytes
34             LDA #>]2
35             FIN
36             STA A2+1
37             DO ]LO3-]LO2    ;and compare lo bytes
38             LDY #<]2
39             FIN
40             STY A4
41             DO ]LO2         ;Is Y-reg = 0 already?
42             LDY #0
43             FIN
44             JSR MOVER
45             <<<
46             FIN
47
48             ORG $800
49             >>> MOVE.$2000;$2FFF;$4000
```

This last MOVE macro still uses POKEWORD once for the first value passed. This is because the macro has no way of knowing the contents of the registers upon entry. For each of the remaining two values to be handled, MOVE separates the high byte and low byte out into variables, and compares the last variables used to the variables about to be used. When they match, assembly is suspended for that load operation, saving unnecessary code. Finally, near the end of the macro, the value that the Y register was last loaded with is tested. If it is zero already, the last LDY #$00 can be skipped. The MOVE macro finishes with the subroutine call to MOVER.

If you've gotten this far, there is a quirk/feature of Big Mac's handling of variables in macros that doesn't seem to be written down anywhere, and so I would like to share. You must be careful to assign only one value to a normal variable for each invocation of a macro from the main body of your program. You cannot safely use that variable again until the macro you have called has finished. This means that you cannot use variables (of course, with the exception of predefined variables ]1–]8, and that only works in one direction) to pass data between macros reliably.

To the best of my knowlege, here's why: During the second pass Big Mac takes through your source code (when it actually generates the object code), when a macro is called, the assembler finds your macro definition, and then does an invisible first pass on it. This includes any calls the main macro may make to other macros as well. In doing so, the assembler is also updating values for the normal variables at the same time. Then, a second pass is taken on the macro, this time generating object code, and printing it as well. During this time, any references to normal variables will be given the value that the assembler last gave to that variable. This is true regardless of what you may see assembling on your screen; a variable may hold only one value during the assembler's stay in your macro.

That is why the final version of MOVE uses 6 variables to hold the high and low bytes of three 2-byte values. Any re-assignment of value to a variable would have made the former value of that variable unavailable to the object code at any time.

## How To Put Macros To Use For You

I hope you have enjoyed (or, at least, understood) this exploration of the world of macro assembling. I have attempted to show that macros can afford you shorter, cleaner, easier-to-read source code that is less tedious to write, and, hopefully, more fun, too. Macros are, in a very real sense, your tool to extend the commands available in assembly language.

If you're convinced, here's a place to start: Look at source code you've written. Find the patterns in the source, the places where you wanted to generalize function into a subroutine and couldn't. Think about how you program. What are the repetitive tasks that you end up doing, the sequences of instructions that you seem to key in over and over? These are the places that are likely to benefit from the use of macros.

The best part of all is that, with more of the work out of the way, you end up with more time to put toward making your programs as good as they can be.


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# Computers in Higher Education

**Jeffrey M. Jacques, Ph.D.**

*Students remember. . .*

*10% of what they read*
*20% of what they hear*
*30% of what they see*
*50% of what they hear and see*
*70% of what they say and write*
*90% of what they do*

(after *New Horizons For Learning*, 1981)

There are several basic issues in educational computing that require some clear thinking:

1) how technology (e.g., paper/pencils, calculators, computers) is linked to the educational curriculum
2) what type of software should be used
3) when software should be used
4) how educational resources should be allocated in American society
5) what we expect educational systems to teach
6) what methods should be used to teach the material
7) what we expect our students to master
8) what functions we expect our schools to perform.

Without exploring each of these questions, we are all too likely to find ourselves making large expenditures from limited resources which will not help us to educate this or future generations.

## Education, Philosophy, Curriculum, Methods and Society

First let me summarize my educational philosophy. *Student's learn best by participating in active mastery of clearly defined and limited objectives. Careful implementation and integration of computers, and appropriate well developed off-the-shelf computer software, can assist in providing an opportunity for students to participate in, and enhance the likelihood of, mastery of essential concepts.*

In some cases, specially written software may be needed to accomplish unique educational goals. Such a process is particularly expensive, fraught with difficulties, time demanding, and often falls short of faculty expectations. Alternately, substantial amounts of off-the-shelf software (e.g., word processing, data base management, and spreadsheets) exist which may provide opportunities to improve student's active involvement in their educational outcomes at minimal expense.

It is clear that, in American society, education occupies a feeble position. This has been documented clearly by social scientists for years. An analogy may help. If you think about computers, the rank order of development seems to be: hardware first, software second, and good documentation third. In American society, the rank order of social institutions seems to be: economic institutions first, political institutions second, and educational institutions a distant third. Perhaps one should not be too surprised, therefore, that substantial numbers of potential teachers and students do not wish to work at or attend school, as evidenced by the high teacher turnover rate, and the large number of student drop-outs.

We expect our schools to teach a variety of academic, professional, vocational and personal development courses. The plethora of course alternatives range from the traditionally academic English, Latin and physics courses to the non-academic family-life education, aerospace, and secretarial courses. While these courses appear to have little in common, one dominant teaching methodology—at all levels of the educational system—still cuts across most educational tracks. This teaching method is the lecture.

Ericksen, a learning psychologist, asks, "Is lecturing really teaching?" He points out that the lecture, despite its instructional vulnerability, has become a security blanket for a majority of professors, without which they would neither feel like teachers nor be recognized by their students as such. Implicit in this lecture technique is the belief that the lecturer does something *to* the students rather than *with* the students. Such an approach trains the student to be passive.

While some have argued that training the student to passivity is a latent objective of our educational system, others have noted that the heavy reliance on the lecture method is simply a function of the long standing continuation of traditional teaching methods, a reflection of the current process of training teachers, and/or caused by the current state of technology. In any case, the continued reliance on the lecture method and the use of the same standardized examples for all students give them too few opportunities to have their educational needs met or to pursue avenues of interest. In sum, the classroom environment seems to foster passivity by concentrating on memorizing and regurgitating what has been presented in the classroom rather than providing opportunities for active mastery of the material and the applications of the concepts to unique and interesting situations.

## Educational Curricula and Technology

Although it may not be obvious, the level of technology has always in-

fluenced what and how we teach. Our vocational curriculum has reflected, in part, the state of technology by the types of machinery, construction equipment, typewriters (e.g., manual, electric, or electronic typewriters), etc. Academic courses, such as those in any science program, have had a similar link to technology in terms of laboratory equipment.

Academic course content has also had a link to technology—albeit a less visible one. By examining the curriculum within each educational track, this linkage becomes clear. Curricula for most academic educational tracks may be divided into three basic components: 1) substantive material, 2) theory, and 3) data collection and analysis.

This link to technology may be easily seen in the area of data analysis. Before the 1960s we were restricted to data sets with few variables and few observations—e.g., data sets of less than 100 cases and generally less than 10 variables. Even with these small data sets, hand tabulation (with or without a slide rule) required extensive and time consuming effort. The development of time saving computational procedures was a natural solution to the lack of sophisticated technology and the hours required to answer even basic analytic questions.

With the advent of electronic portable calculators during the 1960s and 1970s, more computational routines were developed. Over time, these routines have all too frequently been treated by students as the substantive material of data analysis courses. When instructional objectives were developed, faculty often emphasized the use of computational routines rather than concepts, applicable formulae, and applications. Although computational routines have their place, they often require substantial and unnecessary student effort.

Here's a case in point. Data analysis courses typically examine the variance of a distribution of scores. The concept of variance is one of the highly useful statistics for describing the spread of scores on a variable. The variance and its square root, the standard deviation, enable: 1) comparisons between different distributions, 2) precise interpretations of scores within a distribution, and 3) more advanced statistical analysis.The definitions of variance in most statistics texts are quite similar; "The variance is...the sum of the squared deviations from the mean divided by N" (Runyon and Haber, 1976:98). The conceptual formula for computing variance reflects this definition:

$$\text{VARIANCE} = \frac{\text{SUM}(X - X)^2}{N}$$

where:

X = data value of an array
X = mean value of the same array
N = number of data values in the array

Such conceptual formulae are easily mastered by most students. Most texts, however, minimize the conceptual formula and move directly into a discussion of computational strategies. Here are several examples of algebraically equivalent formulae:

$$\text{VAR} = \frac{\text{SUM } X^2}{N} - X^2$$

$$\text{VAR} = \frac{\text{SUM } X^2}{N} - \frac{\text{SUM } X^2}{N}$$

$$\text{VAR} = \frac{\text{SUM } X^2 - \frac{(\text{SUM } X)^2}{N}}{N}$$

$$\text{VAR} = \frac{N \text{ SUM } X^2 - (\text{SUM } X)^2}{N^2}$$

$$\text{VAR} = (i)^2 \frac{\text{SUM F } X_9^2 - \frac{(\text{SUM F } X_9)^2}{N}}{N}$$

where:

i = class interval width
X′ = temporary X values
F = frequency of class interval
N = number of cases

Each of these formulae move the learner further and further away from the concept that we wish the student to master. Clearly, the last formula has, at least for the uninitiated, all too little to do with mastering the conceptual formula for variance.

Furthermore, by choosing to emphasize one of these computational routines, faculty divert student energy and time which could be better spent on learning what the formulae mean, how


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statistical formulae are inter-related, and how statistical procedures may be used. Thus, the technology of 1960s and early 1970s—in this case, technology based on calculators—determined the substance of the curriculum.

By the early 1970s, most large universities had access to large, mainframe computers. Students enrolled in research and statistics courses were often exposed to SPSS (Statistical Package for the Social Sciences, Nie et al, 1970), BMD, SAS or other number-crunching software packages. By the mid 1970s, other colleges and universities had access to either large mainframe or minicomputers which supported one or more such packages.

Even where faculty chose to use statistical packages, they typically did so as an addition to their traditional course requirements. Since such packages rarely provide for instruction in the area of research or statistics, course content remained "calculator based" and instructional methodology heavily emphasized the lecture approach.

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This is not to take away from such computer software. Most statistical packages effectively do what they were designed to do; they provide a sophisticated software approach to data analysis for a production environment. Such an approach, however, leaves the student with a magic box impression and without an opportunity to master how his/her data produced a specific result. Production environments, however, are not educational environments.

Since the advent of microcomputers in the late 1970s and 1980s from Apple, Atari, Commodore, Tandy and others, inexpensive computing has become increasingly available at all types and levels of educational institutions. Statistical packages developed for microcomputers have been patterned after their mainframe cousins. (Indeed, SPSS, Inc. is marketing a version which runs on an expanded IBM-XT.) They provide strong computational routines but still lack instructional components. I have yet to find an explicitly developed good statistical package which provides for both ease of computations and instruction!

## Alternatives to Passivity and Calculator Based Curriculum

What is needed in such courses are curriculum material which emphasize concepts and applications as well as a teaching methodology which moves away from heavy reliance on the lecture method. Microcomputers and off-the-shelf, sophisticated software are reasonable tools since they can take the drudgery out of the arithmetic computations while allowing for speedy analysis without the loss of what and how computations are being executed. Spreadsheets, for example, are a perfect tool for courses which require computational solutions to equations in business and in most of the natural, social, and behavioral sciences.

The changes in technology also provide us with an opportunity to change our teaching methods. An alternative to the lecture method is "process teaching/learning"—the instructor acts as a facilitator for student self-learning. Elbe (1971:6) noted that "If teachers are to claim a worth at all, it must be in a large sense because of the interactions between teacher and student which motivates the student to become a self-motivating learner."

## Conclusion

The changing technology provides us with an opportunity to move away from our historic reliance on the lecture teaching method and unnecessarily confusing curricula based on earlier technology to "process teaching/learning" of concepts and their applications.Such an approach may help students master the essential material. The availability of word processing, data base and spreadsheet software provide us with an enormous opportunity to implement student discovery and process teaching/learning.

A word of caution is in order about implementing microcomputer-based instruction. In some cases, the software can be designed to perform all the computations and make appropriate decisions. In my opinion, such routines are less appropriate for the classroom environment since they provide little opportunity for student input and decisions. In my judgment, they should be restricted to production environments.

Implementation of micro-computers may have additional implications. First, it may be more difficult for academic areas to perform one of their traditional functions—i.e., identifying the "good" student and filtering out the "poor" student. Indeed, our definition of "good" and "poor" student may change from criteria based on memorization and regurgitation to criteria based on logical reasoning, correct applications of concepts, and effective and reasonable use of resources.

Furthermore, the absolute number of students mastering the material may increase, since large amounts of trivia may be replaced with essential and meaningful concepts. Perhaps this is timely given the reduction in enrollments which is due in part to the changing population pyramid.

Microcomputer technology also provides an opportunity to move away from the traditional adversary relationship between teachers and students. We now have an inexpensive tool where we may move towards a partnership in which both students and teachers emphasize the need to master conceptually important material, and to resolve application questions and issues by implementing appropriate, student-based projects.

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**Product Code: SAMP** **Price: $22.50**

### AP FILE

Serial line editor for creating and easily editing sequential (EXEC) text files. Accompanying utilities offer ability to display disk and RAM memory in various formats, transfer text and binary files, list and change the location of Applesoft programs in memory and more. Documentation explains how programmers may modify and expand the line editor to their own specific applications.

**Product Code: SAPF** **Price: $18.50**

### AP GRAPHICS: "The Filler"

Useful tool for game and applications developers requiring FAST, colorful, high–resolution quality graphic displays. "The Filler" features a fast machine language program that is easily transferred to your BASIC programs. The simple Ampersand commands make this graphics utility easy to control. You may fill any area of the Apple screen with up to 21 colors & a myriad of user–definable patterns. You can create and edit your own unique hi–res pictures with the easy–to–use picture editor. Document covers all aspects, functions, and uses of this fine tool, but assumes you have a working knowledge of Applesoft BASIC.

**Product Code: SFLR** **Price: $17.00**

### AP MAIL II Version 3.0

ApMail is designed to be easy to learn and use with fast data entry/retrieval. Sorting may be performed on any one of the 10 data fields, supports the printing of 1–up to 4–up labels, and stores up to 800 names per diskette. Full documentation is included for properly configuring the program to your system. Version 3.0 is compatible with previous versions of ApMail.

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### APMAIL.PRO By Ken Kashmarek, D.D.Redhed and F.W.Merchant

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### THE APPLESOFT CARPENTER

A collection of seven utilities which enhances programming productivity.

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**The Converter:** converts Integer Basic files to Applesoft.
**The Constructor:** allows Integer Basic to be converted to Applesoft format to provide back up documentation of original program.
**The Finder:** finds all occurrences of a string.
**The Keeper:** allows you to preserve variables during line editing.

This diskette is a much revised version of the original Carpenter.

**Product Code: SCAR** **Price: $18.50**

See page 22 for Product Reference Index

# Software

NEW **APPLESOFT PROGRAM EDITOR**
**by Richard Hackl**

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## BIG MAC.C

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# Software

## CATER KILLER
### By Jeff Koftinoff

Cater Killer is a multi–level action arcade game that can be played with keyboard or joystick providing hours of enjoyment for young and old alike. The scenario is that you are alone in a world populated by Cater Killers which are very hazardous to your health. You must take food away from the baby Cater Killers and if you get all eight foodstuffs, you advance to the next level. There are three screens and several levels.

**Product Code: SCATKI** **Price: $12.50**

## DICE

Special routines designed specifically for use with lower case adapters such as ApLCase, Dan Paymar and all others. DICE makes it easy to type in and display UPPER and lower case characters and special symbols directly from the keyboard. Utility also features a scrolling speed control, stop/start list, handy control character functions, non–flashing cursor and detailed instructions for making the "shift key" modification to your Apple.

**Product Code: SDIC** **Price: $12.50**

## DIRECTORY TITLE WRITER
### By Val Golding

A DOS 3.3 utility that lets you create elaborate and fancy catalog titles. Type inverse, flash, and lower case directly from the keyboard. Program comes complete with documentation.

**Product Code: STITWR** **Price: $15.00**

## DISK ANALYZER 1.3
### By Ronald A. Thisted, Ph.D.

This is a utility for viewing and printing the raw contents of a disk. Features a specially formatted printout of the VTOC, catalog, and track/sector list. Once this information is viewed, you can proceed to read sectors of any particular file. This is especially useful in investigating bad word processor files. The program is especially well documented to provide a learning experience in programming and in using RWTS. The program is mostly in Applesoft and Big Mac source files are included for the binary portion of the program. This program can be used by a beginner and will be useful to most anyone. Requires any Apple with Applesoft and one disk drive. A printer is useful.

**Product Code: SDOSAN** **Price: $12.50**

## DISPAK 7

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- edit a transaction easily at ANY time using full screen cursor control
- choose from a wide variety of printed reports including year–to date, monthly budget totals, monthly actual totals, income statement, comparative balance sheet, cashflow, net worth statement or monthly detail for a particular account.

Some reports, can be selected on a quarterly basis. Your reports can be previewed in either 40 or 80–column mode on screen or sent to a wide range of printers. You may generate bar–graphs which can be viewed on screen or dumped to your printer in black and white or color, normal or double size using a Grappler–type interface card, or saved to disk for later display using available printing programs. DOLLARS AND SENSE comes with an extensive and easily understood manual with a special section, Suggested Applications, which describes ways to use DOLLARS AND SENSE for basic budget management, preparing income taxes, business–related applications, managing investments and more. After months of testing and evaluating home accounting packages, we are pleased to announce this new addition to our software line. Program is copy protected.

For the Apple II, II+, //e version a backup copy is available from the publisher for $20.

The Apple //c, //e version uses mouse for pointing device if available. For //c or //e with an extended 80 column card, the "help" screens are instantly available. (Backup disk included)

The Macintosh version uses pull–down menus and mouse. (Backup disk included)

| | Product Code | Price |
|---|---|---|
| II+ //e | SDAS2E | $75.00 |
| //c //e | SDAS2C | $83.50 |
| Mac | SMCDAS | $112.00 |

## DRIVE ANALYZER DISKETTE

This precision alignment diskette is a sure way to determine if your disk drive is operating properly. Menu–driven tests determine state of radial alignment, disk centering, speed and write/read. From Verbatim.

**Product Code: SDAN** **Price: $20.00**

## EAMON ADVENTURE VOLUMES

**An adventure game that takes you back to the days of sorcerers and magic. Encounter various obstacles requiring different responses depending on your character. Great fun for the wise. (You will need the Beginner's Cave in order to run any of the other Eamon Adventures.)** Product Code SEAMON **Price: $5.00**

Eamon 0– Dungeon Designer Eamon
Eamon 1– The Beginner's Cave
Eamon 2– Lair of the Minotaur
Eamon 3– Cave of the Mind
Eamon 4– Zyphur River Venture
Eamon 5– Castle of Doom
Eamon 6– Death Star
Eamon 7– Devil's Tomb
Eamon 8– Abductor's Quarters
Eamon 9– Assault on the Clone Masters
Eamon 10 – Magic Kingdom
Eamon 11 – Molinar's Tomb
Eamon 12 – The Quest for Trezore
Eamon 13 – Lost Island of Apple
Eamon 14 – The Underground City
Eamon 15 – The Caves of Treasure Island
Eamon 16 – Furioso
Eamon 17 – Merlin's Castle
Eamon 18 – Hogarth Castle
Eamon 19 – Death Trap
Eamon 20 – The Black Death
Eamon 21 – Improved Dungeon Designer
Eamon 22 – The Senator's Chambers
Eamon 23 – The Temple of Ngurct
Eamon 24 – Black Mountain
Eamon 25 – Nuclear Nightmare
Eamon 26 – Assault on the Mole Man
Eamon 27 – Revenge of the Mole Man
Eamon 28 – The Gauntlet
Eamon 29 – The Caves of Mondamen
Eamon 30 – Heros Castle
Eamon 31 – The Tower of London
Eamon 32 – The Feast of Carroll
Eamon 33 – The Master's Dungeon
Eamon 34 – Crystal Mountain
Eamon 35 – The Lost Adventure
Eamon 36 – The Manxome Foe
Eamon 37 – Behind the Sealed Door
Eamon 38 – The Land of Death
Eamon 39 – The Jungles of Vietnam
Eamon 40 – The Black Castle of Nagog
Eamon 41 – The Sewers of Chicago
Eamon 42 – Caverns of Doom
Eamon 43 – Valkenburg Castle
Eamon 44 – Modern Problems

NEW

## ELF ABC

Elf ABC is delightful entertainment for children age 2–5. Each keypress brings another whimsical color picture accompanied by some well–chosen classical music in two harpsichord voices. Does it teach reading? No . . . but no harm in some light–hearted exposure!

**Product Code: SELF** **Price: $15.00**

## E–Z PILOT

An easy–to–use version of Apple Pilot, especially useful to school teachers and parents. You and the children will enjoy interactive computer sessions. The diskette comes with several sample lessons and straightforward instructions on how to create your own. Pictures created by the Koala Pad, Applesoft shape tables or other graphics generation methods may be freely mixed with the text of your lessons. Programs can talk to your students if your computer is equipped with a Mockingboard. Also features a fast DOS, Diversidos and moves DOS to the language card.

**Product Code: SEAP** **Price: $28.50**

## FARWORD
### By John Shanks and Fred Lautzenhiser

A high quality line oriented word processor. Features 40 column editing with 80 column preview. Text is easily edited, inserted, moved or deleted using the same command structure as Big Mac. Any portion of the text can be saved to disk and disk files can be easily inserted. Lines can be alphabetized. Formatting capability is exceptional, any function of your printer can be utilized. A line editor is especially useful for writing outlines, lists of data, fact sheets or any situation where text manipulation is needed. Requires a 64K Apple with Applesoft and one disk drive. An 80 column card, additional disk drive, lower case chip and shift key modification are desirable.

**Product Code: SFARWO** **Price: $12.50**

NEW

## /// E–Z Pieces
### by Haba Systems

Word Processor, spreadsheet and database manager for the Apple *III*. Data can easily be moved among the three applications. Learning is simplified since all applications use similar commands. This program was developed by Rupert Lissner, author of Quickfile, and is the Apple *III* version of Apple Works produced for the Apple ][. The program runs on any Apple *III* and is Catalyst compatible. Manual and 3 diskettes.

**Product Code: SEZPIE** **Price: $250.00**

NEW

## THE FONT ALBUM
### by Andrew Wicker

Here is a brand new set of over forty fonts for use with Higher Text. Find just the one for the program you are writing. You'll find a wide variety of thin, thick, slanted, shadowed, and stylized typefaces. There is even one patterned after that voracious little arcade game character who has consumed so many quarters! Some fonts include special shapes, creatures, tanks, and other objects that can be used for programming character graphics in creating games.

**Product Code: SFTALB** **Price: $12.50**

## NEW GRAFMAGIC

GRAFMAGIC is an ampersand extension to Applesoft BASIC offering 64 new commands as well as a powerful Hi–Res character generator. Commands are included to scale, rotate, invert, erase, copy, scroll (in four directions), fill in, and flip selected portions of the screen. Other features include an implementation of Turtle Graphics which allows up to five "turtles" to be moved independently, a sound generator with true–to–pitch notes, a number of demonstration programs, and a help screen for interactive tutorials. The character generator can print text of any size ranging from normal up to full screen and will support underlined, boldface, inversed, super– or subscripted and upper or lowercase characters.

**Product Code: SGRAFM** **Price: $12.50**

## GRAPHICS BUILDER
### By Alton Loe

This is a graphics utility which allows you to draw a hi–res picture and save the picture as a standard binary file or as a more compact text file of x–y coordinates and commands. This program may be used to modify an existing picture, to put labels on a graph or a moustache on Hopalong Cassidy. Additional commands allow expansion or contraction of the picture (and corresponding coordinate table), pen color selection, goto XY, and reference grid. When used in conjunction with APGRAPHICS: The Filler, Graphics Builder makes possible sketch–and–fill techniques very popular for creating hi–res adventure games. Fill commands are recognized by the Graphics Builder's editor if APGRAPHICS: The Filler is in memory.

**Product Code: SGRABU** **Price: $12.50**

## HIGHER GRAPHICS II
### by Synergistic Software

At last we offer you a full–function shape table editor, so you may use the Applesoft DRAW command, the great "sleeper" of HIRES graphics. With this program, you may edit from scratch, view and change shapes from any existing table, or even pull together shapes from several different tables. The Applesoft DRAW command and shape tables offer big advantages in programs where space is at a premium. The disk comes with a wide variety of sample shapes, among them a complete character set. The latter is especially handy for labelling HIRES graphs horizontally, vertically, or even upside down and backwards! You will find that DRAW is even fast enough to do simple animation.

**Product Code: SHIGRA** **Price: $15.00**

## HIGHER TEXT PLUS

Generate upper and lower case text in a variety of typefaces, sizes, and colors from your programs for display on the Apple Hires screen. Features an easy–to–use editor for generation of your own unique character sets (fonts), several utilities to enhance your creation of hi–res displays, wide range of sample fonts, and full documentation. (Note: this program requires and assumes a full working knowledge either Integer or Applesoft BASIC.)

**Product Code: SHTP** **Price: $27.50**

## HIGHER FONTS 1

Need extra character sets for Higher Text Plus, but don't wish to create them? Higher Fonts is a collection of over 25 different fonts or character sets for use with Higher Text Plus. Fonts vary from foreign and ancient language alphabets to special math and scientific symbols and game building characters. Use of fonts is demonstrated by several display programs.

**Product Code: SHFI** **Price: $13.00**

## IMAGINATOR

An exciting new series of professional quality 3D GRAPHICS programs. IMAGINATOR will let anyone interested in computer graphics create, edit, manipulate and display 3D graphics images. You do not have to be a programmer to use IMAGINATOR. Three–dimensional objects can be created without drudgery using IMAGINATOR's powerful graphics editor. Once the objects have been created, they can be manipulated and displayed in a variety of ways using IMAGINATOR's unique and highly versatile set of interactive display commands. Images can be displayed on the Apple II hi–res screen, dumped to printer or saved to disk as binary picture files. Works with the Apple II, II+ or *IIe* and requires 48K and one disk drive. Program is unprotected and includes complete documentation.

**Product Code: SIMAGI** **Price: $50.00**

## LIFESAVER

The Lifesaver is the most advanced and easy–to–use disk recovery program on the market today. It checks disk drive speed and selects drive closest to the speed your disk was recorded on. It then scans disks, track by track, recovering data files without going through the VTOC and displays results on the screen. Lifesaver READs: Information from damaged sectors (unlike other copy/recovery programs that crash at the damaged sectors), disks that were recorded off–center, and disks with errors caused by hub damage. Lifesaver grades and fixes all possible files and makes recovered files accessible for conventional editing. For use on DOS 3.3, Pascal, and CP/M Disks.

**Product Code: SDISRE** **Price: $21.00**

## LISA QUICKDRAW DEMO DISKETTE
### by David Redhed

This diskette has three Pascal Workshop programs demonstrating QuickDraw graphics. Annotated source code is included to illustrate how QuickDraw is accessed through Pascal. Several features similar to the Office System graphics have been implemented through Pascal procedures in a form adaptable to your own programs.

**Program #1:** Eleven separate aspects of QuickDraw illustrated in a program using mouse–selectable menus.
**Program #2:** A version of Apple Computer's QDSample with annotated source code.
**Program #3:** Illustrates the use of multiple grafPorts in QuickDraw. GrafPorts are the basis for all multiple window effects in the Lisa Office System.

The diskette contains a text file with additional information for running the demo programs. Also included are three Exec files to aid you with compilation and linking when you make changes to the source code.

**Product Code: SQDRAW** **Price: $39.50**

See page 22 for Product Reference Index

# Software

NEW **MAC THE KNIFE** Vol. 1

A treasury of art for the Macintosh with MacPaint. Over 500 useful illustrations, borders, textures, international icons, corporate logos, TWO NEW FONTS and much, much more!

**Product Code: SMCKNF** **Price: $29.00**

## MICROBE

Take a journey through the blood stream of a human body and battle life threatening organisms and diseases while being careful not to injure the human host. A great science and learning arcade like adventure game from Synergistic Software.

**Product Code: SMIC** **Price: $30.00**

## MICROWRITER //e
### By William H. Starbuck

A semiprofessional screen oriented word processor. Features 40 or 80 column edit modes, an 80 column preview if you edit in 40 columns, full //e keyboard support, text insert, delete, move and replace, insert segments from disk, and save segments to disk. Generates standard text files. Printer drivers are included for Epson, Tally, Prowriter and Apple DMP. Full instructions are included to generate additional printer drivers. This word processor is easy to use and will satisfy the requirements of 99% of the users. Requires an Apple //e and one disk drive (**//c compatible**). Supports additional drives and most likely any printer or 80 column card.

**Product Code: SMICWT** **Price: $12.50**

NEW **MICROWRITER II +**

Here it is! The popular word processor for the //e is now available for the Apple II+. Easy to use. Compatible with Videoterm, Viewmaster and most other 80–column cards. Requires Apple II+ with shift–key modification and a lower case chip.

**Product Code: SUWTR+** **Price: $12.50**

## MULTI–TRIEVE

Multi–Trieve is a Data Base system designed to manage a moderate amount of information more efficiently. You can easily create mailing lists, household inventories, and cross–referenced lists for a small library using this program. Fast horizontal scrolling is built in so that you may quickly view all the information associated with any entry. Limited data type checking is provided at data entry time, and the structure of a dataset can be changed even after data are added to a file. Stored information can be retrieved for viewing of reports on the screen or for generating forms/labels on the printer. Entries may be selected using multiple criteria including value ranges. Multi–Trieve data can also be made accessible to DOS 3.3 programs in text or DIF format. Thus data may be moved to and from many programs such as word processors and THE Spreadsheet.

Now supports all 80–column cards.

**Product Code: SMUL** **Price: $50.00**

## MUMMY'S CURSE

Travel to ancient Egypt and try to recover the solid gold death mask of King Ruttattut. Hii–res adventure game has detailed color pictures, lots of mind challenging puzzles and many, many rooms. Watch out for the Mummy! The diskette is unprotected and you will able to study the internals of a professional adventure game.

**Product Code: SMCU** **Price: $12.50**

## MORTGAGES, DEPRECIATION, AND FINANCIAL CALCULATIONS
### By Wayne Pratt

A first rate financial calculation program, MDFC provides a means to print out an amortization of loans involving as many as three mortgages. The financial portion finds internal rate of return, financial management rate of return, net present value, compound interest and discounting, discount a note and yield on a wrap–around note. The depreciation models allow either real estate or personal property to be depreciated. Methods include Pr–1981, straight line and accelerated. These programs will be of great value to homeowners and investors. Requires any Apple (Applesoft) and a disk drive. A printer is recommended.

**Product Code: SMORTG** **Price: $12.50**

NEW **PENSATE**

Outwit the computer's legions of pieces as you make your way across the playing board. Ten distinct types of opposing pieces provide endless variety and challenge in this game of strategy. Hundreds of levels of play with one or two player option.

**Product Code: SPENST** **Price: $28.00**

## PROGRAM LINE EDITOR

Very popular utility package that features user–definable keyboard MACROs, programmable cursor, powerful line editor, upper/lower case input (without loading special driver routines) with AplCase or other lower case adapter, handy 'stop list', and the whole works is transparent to you and your program until called upon! Highly recommended to those who take apart and change their programs and hate to edit/retype lines with their Apple's escape codes.

**Product Code: SPLE** **Price: $15.00**

## PROZAP
### By Gary Charpentier

A new utility uses intrinsic ProDOS routines to read, edit and write any ProDOS block or DOS 3.3 sector all from the ProDoS environment. The disk also contains a utility for dump to disk, printer or monitor, a hex or hex/ASCII listing or disassembly with a search routine for hex or ASCII bytes. Complete with documentation for ProZap only, not ProDos.

**Product Code: SPZAP** **Price: $25.00**

# Software

## THE SCHOOLHOUSE GRADER
### By Jim Campbell

A teachers record book, a class roster and a record of grades, assignments and attendance, as well as statistics are provided. This uncomplicated program should be of great value to teachers who wish to try using a computer for record keeping. Requires any Apple with 48K and one disk drive. A second drive and a printer are recommended.

**Product Code: SGRADE** **Price: $12.50**

## SCRAMBLER
### By Jerry Jongerius
### Jagware

A disk utility to scan a disk for errors and to copy protect your personal software. Each sector of a disk is checked, bad sectors are marked on the screen. Copy protection can be applied to your disk and for added protection you can add a password. Data disks can also be created. This program is of use in the classroom, at school, or might be used in the home to separate family software. Requires an Apple II+ or *IIe* with one disk drive. A second drive and a printer are optional.

**Product Code: SSCRAM** **Price: $12.50**

## NEW SIRIUS SOFTWARE GAME HITS: SPECIAL PURCHASE

All make good use of HIRES color (See the August, 1984 Call–A.P.P.L.E. for details)

| | Product Code | Price |
|---|---|---|
| Buzzard Bait | SBUZBT | |
| Critical Mass | SCRIMS | |
| Fly Wars | SFLYWS | |
| Free Fall | SFREFL | $15.00 |
| Jelly Fish | SJELLY | each |
| Minotaur | SMINOT | |
| Plasmania | SPLASM | |
| Repton | SREPTN | |
| Snake Bite | SSNABT | |
| Twerps | STWERP | |

## SYMBOL SYMON

Easy–to–use development and debugging tool that is designed to assist the assembly language programmer. Symbol Symon makes it simple to understand and debug your programs with step and trace from address to address, address to label (uses symbol table generated from BIG MAC/MAC.LC Editor/Assembler), even label to label. Insert up to 8 BRK points, display memory in both Hex and ASCII, set up and use your own zero page of memory, experiment with the COUT simulator, and more! Program comes with documentation and is a fine addition to your machine language program development library.

**Product Code: SSYM** **Price: $20.00**

## THE SPREADSHEET
### Version 2.0

THE Spreadsheet Version 2.0 is a "new generation" spreadsheet calculator program with all the basic features necessary for creation of complicated models, and many advanced features too. THE Spreadsheet Version 2.0 supports:

- *Most popular 80 column boards.*
- *Optional seventy column software display.*
- *All "language card" compatible RAM cards (up to 512K).*
- *Supports full upper and lower case from any Apple computer.*
- *Variable column widths.*
- *Protected cells, hidden cells, and other advanced features.*
- *Field to field tabbing, for easy data entry.*
- *Hard disk compatibility.*

**Utilizes extra RAM from 80 column card on the *IIe*.**

**Product Code: STSS** **Price: $65.00**

## NEW STARGAZER'S GUIDE
### by Synergistic Software

This program gives you an entertaining way to learn the night skies and recognize the major constellations. Included is a handy reference booklet, a mini–astronomy course complete with explanations of nomenclature, tables of stellar statistics, and folklore about the constellations.

**Product Code: SSTAGU** **Price: $15.00**

## NEW TITLE MASTER

When you want to use the 48 point and 72 point fonts for large titles, do you suffer from the JAGGIES? If so, you need TITLE MASTER. This collection of smoothed and refined characters for six of the MacIntosh fonts makes clean looking large titles for signs, notices and documents. These characters are not available directly from the keyboard. Titles can be constructed by using cut and paste from the Title Master files. A document is included which explains the efficient use of this technique. Fonts supported are: Monaco, Venice, Chicago, London, Athens, and San Francisco.

**Product Code: STITMA** **Price: $20.00**

## TRANSYLVANIA

A hi–res graphic adventure for the Mac. Explore the world of Transylvania and rescue a damsel in distress...but first you must find her. To do so you must travel around, use objects that you find, and solve many puzzles.

**Product Code: STRA** **Price: $25.00**

See page 22 for Product Reference Index

# Software

## TURTLESOFT

This is an excellent program to use in an educational setting making BASIC interesting and fun to learn while at the same time, teaching the powerful ideas inherent in Turtle geometry. TURTLESOFT allows you to combine LOGO–like Turtle Graphics together with Applesoft BASIC. Easy enough to be used by those familiar with the fudamentals of Applesoft (i.e. line numbers etc.), TURTLESOFT can also help an experinced programmer in the development of a variety of graphic displays.

TURTLESOFT is "Full Featured" including all of the standard Turtle commands (&LEFT, &RIGHT, &FORWARD, Etc.) as well as a "sound" command and commands for the advanced programmer. A unique method of naming and accessing subroutines makes them much easier to use and facilitates structured program design. Easily understood error messages make debugging programs a snap. Especially useful for the teacher familiar with BASIC and having no prior experience with LOGO.

**Product Code: STUR** **Price: $22.50**

NEW

## U–BOAT COMMAND
### by Synergistic Software

You are the commander of a submarine in search of a heavily defended enemy aircraft carrier and it's making a break for neutral waters. Watch the sonar scope, air supply, fuel . . . DEPTH CHARGES! . . . steady . . . steady . . . FIRE ONE! Arcade style strategic war game.

**Product Code: SUBCOM** **Price: $12.50**

## UTILITY DISKPAK
### 6B–16

Great utility package that allows you to copy standard disks, map them for bad and unused sectors, reconstruct blown catalogs and physically change existing data, all with a single disk drive! A good set of programs to have tucked away with the Apple DOS manual and Beneath the Apple DOS book.

**Product Code: SD6B** **Price: $18.50**

NEW

## VOLKSFILER
### by Glen Hausler

VOLKSFILER is a freeform electronic card file program where each "card" is represented by your Apple screen. You may enter information wherever you want it on the screen. When you recall the information later, it will appear exactly as you entered it. The first word on each screen is used as a sort key. The fast search command automatically scans the entire contents of every screen for the word you want. Automatic data compression assures efficient use of disk storage. VOLKSFILER is easily mastered and is best suited for informal note–taking and other jobs where a conventional database structure would be too restrictive.

**Product Code: SVOLKS** **Price: $12.50**

## WICKERWARE #1
### By Andrew Wicker

A collection of 11 fun filled and action packed games for various levels and abilities. The 11 assorted games are listed below and require an Apple and one disk drive.

| | | | |
|---|---|---|---|
| Chaser | Trap | Catch | Eat Em Up |
| Block Em | Lunar Lander | Panic | Alien |
| Janitor | Depth Charge | Bouncer | |

**Product Code: SWICWA** **Price: $12.50**

NEW

## XYPHUS

Enter the lost continent of Arroya in search of Xyphus, Lord of Demons. Six increasingly different scenarios, plus a wide variety of spells and weapons will perhaps make this fantasy role playing adventure like no other you've seen. Hi–res graphics. Available Oct. 1st.

**Product Code: SXYPHS** **Price: $28.00**

## ZAPT
### By Andy Tuxen
### Apt Software

A disk utility for altering data on a DOS 3.2, 3.3 or PASCAL disk. With this utility you can change catalog entries, recover deleted files, delete DOS, make modifications to binary programs, and correct corrupted files. In short, you can read or write any byte on a disk. This program is for those who want to learn and for those who have always wanted a (another) ZAP program. As is our policy, this is another well documented and easy–to–use program. Requires any Apple and one disk drive.

**Product Code: SZAPT** **Price: $12.50**

## ZARDAX

Professional–quality word processing easy enough for the beginner to use. Menus for disk and document handling. Editing commands are easy to remember. A Glossary feature allows you to define phrases used repeatedly which you may recall with only two keystrokes. Mail merge is included for form letters or mailing lists. 40 or 80 column display with most popular 80 column cards supported. A complete set of print formatting commands tailored for each printer (over 40 of them, or write your own); you rarely need to remember "control codes" or face the back end of a printer manual. ZARDAX uses standard text files. A printer spooling or pseudo–disk capability is provided (requires 128K RAM card or auxiliary memory). "Chaining" for long documents. Headers, footers, sub–scripting and super–scripting.

This program is copy–protected. Two diskettes are supplied. New features and updates are released periodically on a copyable "utilities" disk. ZARDAX for the II+, *//c* or *//e* uses DOS 3.3. Extra keyboard connector REQUIRED for II+ (unless you have an Enhancer II). *See Hardware Section for Zardax Keyboard Connector.*

ZARDAX for the *///* uses SOS, and adds extra features: up to 197K files, reads, writes and converts ASCII or Pascal text files.

*** Please specify II,II+,*//e*,*//c* or *///* by choosing the appropriate Product Code.**

| | | |
|---|---|---|
| II,II+,*//e*,*//c* | SZARII | **Price: $160.00** |
| *///* | SZARDA | |

# PDS PUBLIC DOMAIN SOFTWARE

Variety of programs at a low cost of 15 to 25 cents per program! Disks contain everything from graphic demos/games to disk and printer utilities, tutorials, business and inventory programs to Pascal and C/PM. Below is a complete listing of our PDS Library, arranged by subject or send us a 37–cent stamped self–addressed envelope for a listing of all the programs on each volume. Please specify volume number when ordering.(Foreign shipping weight: 1/2 oz each disk.) **Price: $5.00**

| VOLUME | TYP | DESCRIPTON |
|---|---|---|
| PDS–000 | INT | APPLE TUTOR |
| PDS–001 | MIX | APPLE TUTOR |
| PDS–003 | AFP | APPLE TUTOR |
| PDS–005 | MIX | HIGHER TEXT UTILITIES |
| PDS–006 | AFP | POLICE – DATA/PLAN |
| PDS–008 | INT | ART & GRAPHICS |
| PDS–009 | INT | ART & GRAPHICS |
| PDS–010 | AFP | ART & GRAPHICS |
| PDS–011 | INT | ART & GRAPHICS |
| PDS–012 | AFP | ART & GRAPHICS |
| PDS–013 | MIX | ART & GRAPHICS |
| PDS–014 | AFP | ART & GRAPHICS |
| PDS–015 | INT | ART & GRAPHICS |
| PDS–016 | AFP | ART & GRAPHICS |
| PDS–017 | INT | ART & GRAPHICS |
| PDS–028 | AFP | ASTRONOMY |
| PDS–029 | AFP | ASTRONOMY |
| PDS–034 | AFP | AVIATION |
| PDS–036 | AFP | AVIATION |
| PDS–042 | AFP | BUSINESS & FINANCE |
| PDS–043 | AFP | BUSINESS & FINANCE |
| PDS–044 | AFP | BUSINESS & FINANCE |
| PDS–045 | AFP | BUSINESS & FINANCE |
| PDS–046 | AFP | BUSINESS & FINANCE |
| PDS–047 | AFP | BUSINESS & FINANCE |
| PDS–048 | AFP | BUSINESS & FINANCE |
| PDS–060 | MIX | CHEMISTRY & BIOLOGY |
| PDS–066 | MIX | EDUCATION & SCHOOL |
| PDS–067 | AFP | EDUCATION & SCHOOL |
| PDS–074 | MIX | MORSE CODE |
| PDS–075 | MIX | MODEM |
| PDS–076 | AFP | ELECTRONICS & RADIO |
| PDS–077 | AFP | ELECTRONICS & RADIO |
| PDS–078 | AFP | ELECTRONICS & RADIO |
| PDS–079 | INT | ELECTRONICS & RADIO |
| PDS–092 | AFP | FOOD |
| PDS–100 | AFP | GAMES |
| PDS–101 | INT | GAMES |
| PDS–102 | AFP | GAMES |
| PDS–103 | INT | GAMES |
| PDS–104 | AFP | GAMES |
| PDS–105 | INT | GAMES |
| PDS–106 | AFP | GAMES |
| PDS–107 | AFP | GAMES |
| PDS–108 | AFP | GAMES |
| PDS–109 | INT | GAMES |
| PDS–110 | INT | GAMES |
| PDS–111 | INT | GAMES |
| PDS–112 | INT | GAMES |
| PDS–113 | INT | GAMES |
| PDS–114 | INT | GAMES |
| PDS–115 | INT | GAMES |
| PDS–116 | AFP | GAMES |
| PDS–117 | INT | GAMES |
| PDS–118 | AFP | GAMES |
| PDS–119 | INT | GAMES |
| PDS–120 | AFP | GAMES |
| PDS–140 | INT | ADVENTURE GAME |
| PDS–141 | AFP | ADVENTURE GAME |
| PDS–142 | AFP | ADVENTURE GAME |
| PDS–143 | AFP | ADVENTURE GAME |
| PDS–166 | AFP | HELLO & MENU PROGRAMS |
| PDS–167 | INT | HELLO & MENU PROGRAMS |
| PDS–172 | AFP | MATH & STATISTICS |
| PDS–173 | INT | MATH & STATISTICS |
| PDS–174 | AFP | MATH & STATISTICS |
| PDS–175 | INT | MATH & STATISTICS |
| PDS–176 | AFP | MATH & STATISTICS |
| PDS–182 | INT | MUSIC & SOUND |
| PDS–183 | MIX | MUSIC & SOUND |
| PDS–185 | INT | MUSIC – MAESTRO |
| PDS–196 | AFP | MISCELLANEOUS |
| PDS–197 | INT | MISCELLANEOUS |
| PDS–198 | MIX | MISCELLANEOUS |
| PDS–199 | INT | MISCELLANEOUS |
| PDS–200 | AFP | MISCELLANEOUS |
| PDS–201 | MIX | MISCELLANEOUS |
| PDS–210 | AFP | MISCELLANEOUS |
| PDS–214 | AFP | UTILITIES |
| PDS–215 | INT | UTILITIES |
| PDS–216 | AFP | UTILITIES |
| PDS–217 | AFP | UTILITIES |
| PDS–218 | INT | UTILITIES |
| PDS–219 | INT | UTILITIES |
| PDS–220 | AFP | UTILITIES |
| PDS–221 | INT | UTILITIES |
| PDS–222 | AFP | UTILITIES |
| PDS–223 | INT | UTILITIES |
| PDS–224 | AFP | UTILITIES |
| PDS–225 | INT | UTILITIES |
| PDS–226 | MIX | UTILITIES |
| PDS–227 | AFP | EPSON UTILITIES |
| PDS–228 | AFP | EPSON GR DUMP |
| PDS–253 | INT | APPLE SOFTWARE BANK |
| PDS–254 | MIX | APPLE SOFTWARE BANK |
| PDS–255 | MIX | APPLE SOFTWARE BANK |

## INTERNATIONAL APPLE CORE

| | | |
|---|---|---|
| IAC–002 | MIX | MISCELLANEOUS |
| IAC–003 | INT | GAMES |
| IAC–005 | MIX | ART & GRAPHICS |
| IAC–007 | AFP | UTILITIES |
| IAC–008 | MIX | GAMES |
| IAC–009 | MIX | MATH & CONVERSION |
| IAC–010 | AFP | ART & GRAPHICS |
| IAC–012 | MIX | UTILITIES |
| IAC–013 | AFP | UTILITIES |
| IAC–014 | AFP | MICROMODEM UTILITIES |
| IAC–015 | MIX | MISCELLANEOUS |
| IAC–016 | AFP | MISCELLANEOUS |
| IAC–017 | INT | GAMES |
| IAC–018 | AFP | UTILITIES & SOUND |
| IAC–019 | AFP | UTILITIES |
| IAC–020 | AFP | UTILITIES |
| IAC–21A | AFP | BULLETIN BOARD PART 1 |
| IAC–21B | AFP | BULLETIN BOARD PART 2 |
| IAC–022 | AFP | VISICALC UTILITIES |
| IAC–027 | AFP | UTILITIES |
| IAC–029 | AFP | BINARY UTILITY GRAPHICS |
| IAC–30A | AFP | ED'S PLOT PACKAGE PART 1 |
| IAC–30B | AFP | ED'S PLOT PACKAGE PART 2 |

See page 22 for Product Reference Index

# PDS PUBLIC DOMAIN SOFTWARE

NEW

## MAC–PDS –1

Introducing the first in our series of Public Domain programs for the Macintosh. Included are applications, BASIC programs, and games. **Price:** $ 7.00 each

| | |
|---|---|
| MAC–001 | MISCELLANEOUS |
| MAC–002 | MISCELLANEOUS |
| MAC–003 | REQUIRES FILEVISION |
| MAC–004 | MISCELLANEOUS |
| MAC–005 | MISCELLANEOUS |
| MAC–006 | PICTURES |
| MAC–007 | REQUIRES MICROSOFT BASIC |

## CP/M

| | | |
|---|---|---|
| CPM–01A | CPM | UTILITIES |
| CPM–01B | CPM | UTILITIES |
| CPM–51A | CPM | MACRO PROCESSOR PART 1 |
| CPM–51B | CPM | MACRO PROCESSOR PART 2 |
| CPM–60A | CPM | DIAGNOSTICS |
| CPM–60B | CPM | DIAGNOSTICS |
| CPM–61A | CPM | MISCELLANEOUS |
| CPM–61B | CPM | MISCELLANEOUS |
| CPM–66A | CPM | ASSORTED HELP FILES |
| CPM–66B | CPM | ASSORTED HELP FILES |
| CPM–76A | CPM | MISCELLANEOUS |
| CPM–76B | CPM | MISCELLANEOUS |
| CPM–83A | CPM | MATH |
| CPM–83B | CPM | MATH |
| CPM–84A | CPM | MODEM PROGRAMS |

## PASCAL

| | | |
|---|---|---|
| PAS–001 | PAS | MISCELLANEOUS |
| PAS–002 | PAS | MISCELLANEOUS |
| PAS–003 | PAS | MISCELLANEOUS |
| PAS–004 | PAS | MISCELLANEOUS |
| PAS–005 | PAS | MISCELLANEOUS |
| PAS–006 | PAS | ATTACH.BIOS |
| PAS–007 | PAS | MISCELLANEOUS |
| PAS–008 | PAS | MISCELLANEOUS |
| PAS–009 | PAS | MISCELLANEOUS |
| PAS–010 | PAS | MISCELLANEOUS |
| PAS–011 | PAS | MISCELLANEOUS |
| PAS–012 | PAS | PAYROLL/LEDGER |

# Hardware

## AP CONTROLLER

Disk controller Card by Micro–Sci that features an on–board hardware jumper to switch between DOS 3.2 and DOS 3.3.

**Product Code: HAPC** **Price: $85.00**

## AP L CASE 1

Lower case adapter for Apple Motherboard revision *#6* and earlier (the REV 0 through REV 6 have memory select blocks located on the left hand edge of the Motherboard–position 1, rows D,E,F). Chip is compatible with both Apple BASICs, Pascal, CP/M, and most word processing software allowing lowercase display. Document shows how to install the ApLCase 1 quickly and easily so that you will be up and using lowercase in very little time.

**Product Code: HLC1** **Price: $30.00**

## AP L CASE 1 WITH DICE

See DICE description in Software section.

**Product Code: HLCIA** **Price: $37.50**

## AP L CASE 2

Same features as our original ApLCase above, but specifically for those post Rev 6 apples (Rev 7 thru Rev RFI D). Includes easy installation instructions and program patches.

**Product Code: HLC2** **Price: $25.00**

## AP L CASE 2 WITH DICE

See DICE description in Software section.

**Product Code: HLC2B** **Price: $30.00**

## AP COOL KIT

Air conditioning for your Apple computer to keep it cool and calm during those heated times that you are not. This fan will reduce deleterious effect of heat build-up and thermal expansion. Kit contains low speed, low noise 3½" muffin type fan, line cord with switch, mounting tape and easy installation instructions. **(NOTE: The AP COOL KIT does not fit //e ).**

**Product Code: HAKK** **Price: $25.00**

## AP DRIVE

One hundred percent compatible, 35–track disk drive for your Apple computer or look–alike. The Ap Drive is compatible with your existing Apple Disk Controller, Ap Controller or APPLEsurance Card thus affording you cost effective floppy storage and greater system flexiblity. Ap Drive is a Shugart SA390 with a Micro–Sci Analog board and carries a 120 day warranty against defects in materials and workmanship through the manufacturer. Comes with a beige cabinet, connecting cable, manual and test disk.

**Product Code: HAPD** **Price: $205.00**

## APPLESURANCE

Unique disk controller card for your Apple II computer and 5¼" disk drives. Performs diagnostics of critical Apple hardware on power up – all automatically, in seconds! Provides descriptive error messages, even indicating which IC is bad. You even have the option of selecting more tests (quick/continuous RAM/ROM, Processor, Keyboard, Color, Screen, and Drive Speed) from its on–board menu. Full documentation is included. Can you afford to be without APPLEsurance?

**Product Code: HAUD** **Price: $85.00**

## AP RAM 16K

Plug in another 16K of memory to your 48K Apple with our economical 16K RAM card. Quality–made card plugs into slot 0 of your Apple and provides extra memory for loading the alternate BASIC language, Pascal, CP/M, moving DOS, and running GPLE and BIG MAC.LC as well as other software and hardware packages requiring the extra room.

**Product Code: HP16** **Price: $55.00**

## AP RAM 128K

Same features as our 16K board above, but with 128K of RAM memory instead! Our 128K card will slide into any Apple slot and, with the included software, emulate a disk drive, expand THE Spreadsheet Version 2.0, operate under CP/M and Pascal. Greatly expand your available memory with its memory expansion software. Package includes all software, hardware, and documentation needed.

**Product Code: HP28** **Price: $295.00**

NEW

## APPLESOFT UTILITIES ADD–ON FOR THE ULTRA–ROM BOARD

APU2 contains programs:

- to safely and automatically number your program lines.
- to hide one or more programs in memory.
- that show size of Applesoft program and amount of remaining free space.
- to safely insert subroutines or whole blocks from other programs quickly and easily.
- that show a list of any or all variables in an Applesoft program.
- that renumber your entire program or any portion thereof, flag references to nonexistent line numbers, print a listing of all changes made to program during renumber and much more!

**Product Code: HRENUM** **Price: $29.00**

## APPLE *III* DISK DRIVE

Model A3 by MicroSci (carries same warranty as AP DRIVE).

**Product Code: HDR3** **Price: $285.00**

## APPLE *IIe* 80 COLUMN, EXTENDED RAM BOARD

Quality board made especially for A.P.P.L.E. For the Apple *IIe* ONLY. RAM board contains 64K of memory and uses standard Apple Protocol.

**Product Code: H80C** **Price: $120.00**

NEW

## DRIVE ADAPTOR *IIc*

With this part you can adapt any Apple compatible disk drive to operate with your Apple *IIc*.

**Product Code: H2CCBL** **Price: $15.00**

## DISK COPY EDIT ADD–ON FOR THE ULTRA–ROM BOARD

SMARTCOPY/APZAP contains two programs. SMART COPY copies up to 40 track disks in BASIC, Pascal, CP/M and ProDOS formats. READ, EDIT, or WRITE to any track sector. AP–ZAP is a complete menu driven disk–sector editor.

**Product Code: HDSCPY** **Price: $32.00**

## HOME CONTROLLER

With your Apple, a BSR X–10 Electrical controller (available at your local hardware/department stores), the VersaCard and this package, you can keep your home secure, turn electrical devices on/off, control temperature all under computer control. The Home Controller includes an ultrasonic transducer, a utility diskette and a VersaCard diagnostics diskette.

**Product Code: HHOC** **Price: $40.00**

## KOALAPAD TOUCH TABLET

The KoalaPad Touch Tablet is a state–of–the–art position sensing device. It converts finger or stylus pressure and movement into electronic signals for controlling computers and is particularly useful for drawing pictures and pointing to pictures on the screen. By using the Micro Illustrator program (comes with package kit), you can create geometric shapes or draw freeform. All the options of color and design are at your fingertips from a powerful on–screen menu. It's fun to use, especially with a color monitor, and plugs into your game I/O socket. Works with the Apple II, II+, and *IIe*. We suggest purchasing a Paddle–AdApple (HPADDL), so you can leave your game controller plugged in at the same time.

**Product Code: HPAD** **Price: $95.00**

## KOALAPAD TOUCH TABLET (for the *IIc*)

**Product Code: HKOA2C** **Price: $95.00**

## MACH II JOYSTICK

The ultimate joystick with totally coordinated X/Y control (not just a four–way switch like many other joysticks). Stick movement is precisely translated to cursor positioning on the screen. Fine trim adjustments on both axes will enable operator to finely tune the joystick to electrical center for each software requirement. Joystick features a self centering function which can be easily disengaged. Works with Apple II and II+ and comes with a full 90–day warranty.

**Product Code: HJOYST** **Price: $34.00**

## MACH III JOYSTICK

Same description as above. In addition, joystick features a push button switch on the stick handle and a stainless steel ball as the main pivot to provide even greater accuracy, reliability and movement.

**Product Code: HJMACH** **Price: $44.00**

## MACH III JOYSTICK (For the *IIe*)

This is the same joystick as the MACH III except that it is specially designed to fit the *IIe* socket. (DB–9).

**Product Code: HJOMA3** **Price: $49.00**

See page 22 for Product Reference Index

# Hardware

## MOCKINGBOARD

A peripheral device that generates sound effects, music and speech from your Apple computer, Mockingboard offers unlimited vocabulary and talks as you type. You can make Mockingboard talk, sing, spell, recite poetry, add synthesized speech, music, and sound effects to your own programs, and more. Supported by dozens of software programs.

Mockingboard has two sound chips, thus two channels of sound with a total of six sound effects/music voices. There are volume controls right in the board. Includes speaker cables compatible with most stereo speakers and Mockingboard B speech upgrade.

**Product Code: HMOBII** **Price: $165.00**

## MOCKINGBOARD for the //c

This is the only peripheral that provides speech, music and sound effects with software support for the //c. It is completely self–contained and has its own onboard stereo speakers. Available for shipment in June, 1984.

**Product Code: HMOB2C** **Price: $165.00**

## MULTIMODEM //e TELECOMPUTING SYSTEM

A 300 baud intelligent plug–in modem card *and* MultiCom II communications software. Serial interface card not required. Includes automatic dialing, automatic answering, busy number redialing, and phone number storage. Dial from your Apple keyboard. A speaker allows you to monitor the progress of your call. Plug in your telephone and use the same line for talking. Compatible with Apple II,II+,//e.

**Product Code: HMOD2E** **Price: $199.00**

NEW

## MULTIMODEM HC3

This modem for the Apple //c is fully Hayes compatible to work with the most popular terminal programs. Comes with the necessary cable to connect it to your Apple //c. Other features incluqde front panel status lights for Receive Data, Transmit Data, Carrier Detect, Off Hook, Terminal Ready and Modem Ready, built–in speaker, and attractively styled case.

**Product Code: HMODC** **Price: $225.00**

NEW

## MULTIMODEM 212HC

Full Bell 212A and Hayes Smartmodem 1200 compatibility for 0–300/1200 baud operation. Front panel status lights and speaker included for monitoring the progress of the call. You will need to provide the standard RS232 serial interface and cable.

**Product Code: HMODHC** **Price: $425.00**

NEW

## MULTIMODEM 212PC

This plug–in 1200 baud modem board is all that you will need to start communicating on IBM PC's and their compatibles. Great for your "other" computer at a fantastic price!

**Product Code: HMODPC** **Price: $399.00**

## A.P.P.L.E. MEGA–VAULT 10 MEGABYTE HARD DISK

Announcing the marriage of the right disk, the right controller, the right operating system(s), the right name, and THE RIGHT PRICE. This is the one we have been waiting for. Super–reliable Xebec model 9710 hard drive with the well–proven S1410 drive controller. Supports ProDos, DOS 3.3, CP/M, and Pascal files all at one time. You choose how you want the 10 megabytes partitioned among the four operating systems. Large volumes are supported in ProDOS. DOS 3.3 volumes can be up to four times the normal size. Under DOS 3.3, the system will work with DOS moved to the language card. Built in error detection and correction assures a hard error rate of only one bit per trillion.

SPECIFICATIONS:

| | | |
|---|---|---|
| Bytes/Sector | | 256/512 |
| Sectors/Track | | 32/17 |
| Formatted Capacity | | 12MB/10.6MB |
| Cylinders: 306 | Heads: 4 | |
| Average Access: 85 msec (incl. settling) | | |
| Average Latency: 8.33 msec | | |
| Height: 5" | Width: 6.62" | Depth 14.75 |

**Product Code: HHARDR** **Price: $1,095.00**

NEW

## MULTIVIEW 80/160

Here is a high-performance video display card with a good selection of modes for use with a standard monitor such as the Gorilla, NEC, BMC, and others with a minimum 12 MHz bandwidth: 80 X 24, 96 X 24, 132 X 24, 160 X 24. Additional modes (80 X 32, 80 X 48, 132 X 30) use interlace. While interlacing can be displayed on a standard monitor, a high persistence monitor such as Amdek 300 or Apple *III* would be a necessity for long-term use. Other features include a useful "Eye-saver" command for adjusting the display to fill the monitor screen. Screen attributes may be set easily; choose twelve combinations of underlining, bold, normal and inverse. Uses standard protocols to work with CP/M and Pascal. A special preboot program is available for compatibility with THE Spreadsheet Version 2 and others. A handy reverse scrolling command is implemented which makes use of the full 4K video buffer. In 80 X 24 display mode, you can back up and view again more than 25 lines that had disappeared off the top of the screen. (Modes that display more characters on the screen can reverse scroll fewer lines). Draws about 25% less 5 volt power than the Ultraterm.

**Product Code: HMULTI** **Price: $249.00**

## PADDLE–ADAPPLE

Expand your game Paddle/Joystick/KoalaPad world with this game I/O extender. The Paddle–AdApple offers two 16–pin connector sockets on one 18 inch cable enabling you to plug in two exterior devices (i.e., KoalaPad and Joysticks) at the same time. In addition, a fourth cable goes to a configuration block if you want to run two joysticks at the same time. The 18" cable lends more mobility to you.

**Product Code: HPADDL** **Price: $25.00**

# Apple® *II*+ and *II*e owners: Don't go to the computer store when you need more computer storage.

# Go to the

## BUY THE SIDER:™ 10 MEGABYTES OF FIRST CLASS MASS STORAGE AT A BULK RATE PRICE.

You need more storage for your Apple *II+* or *IIe* than your trusty little floppy disk drive can deliver. And you're thinking about going down to your local computer store to check out your next logical storage step: A hard disk file. Sure, you'll have to face several hard facts. One, you know it's going to cost you an arm and a leg, particularly from your computer dealer. And two, you heard that the state-of-the-Winchester-art is less than it's cracked up to be. But you and your Apple are caught between a rock and the hard facts. If you're going to compute, you've got to store, and what alternative is there to ye old computer store?

First Class Peripherals. And what an alternative we offer! Our message is a simple one: *We have the finest, easiest-to-install 10-megabyte Winchester hard disk subsystem in the industry today, bar none. And we have it, direct through the mail to you, for the best price. Period.*

### The Sider: Absolutely First Class, Inside And Out.

True to our name, we simply wouldn't offer a product that wasn't first class, inside and out. And The Sider is evidence. Outside, that fact is obvious. Just take a long, lean look at it. While Apple may have written the book on micro-computing, First Class Peripherals has clearly written the bookend. The Sider's compact, smart-looking cabinetry is a true complement to the computer alongside which it works, and an unobtrusive, space-saving partner as well.

Inside, that quality look is matched by the highest quality components, from the half-height 10-megabyte Winchester, to the best-selling intelligent controller in the business, right down to the power supply. The most comprehensive component-to-component testing ensures first class reliability, day-in and day-out. And advanced internal design has allowed us to build these components into this modestly-sized casing in such a way that we've even eliminated the need for a cooling fan.

### From Hotline To Swapline, A First Class Commitment To Support.

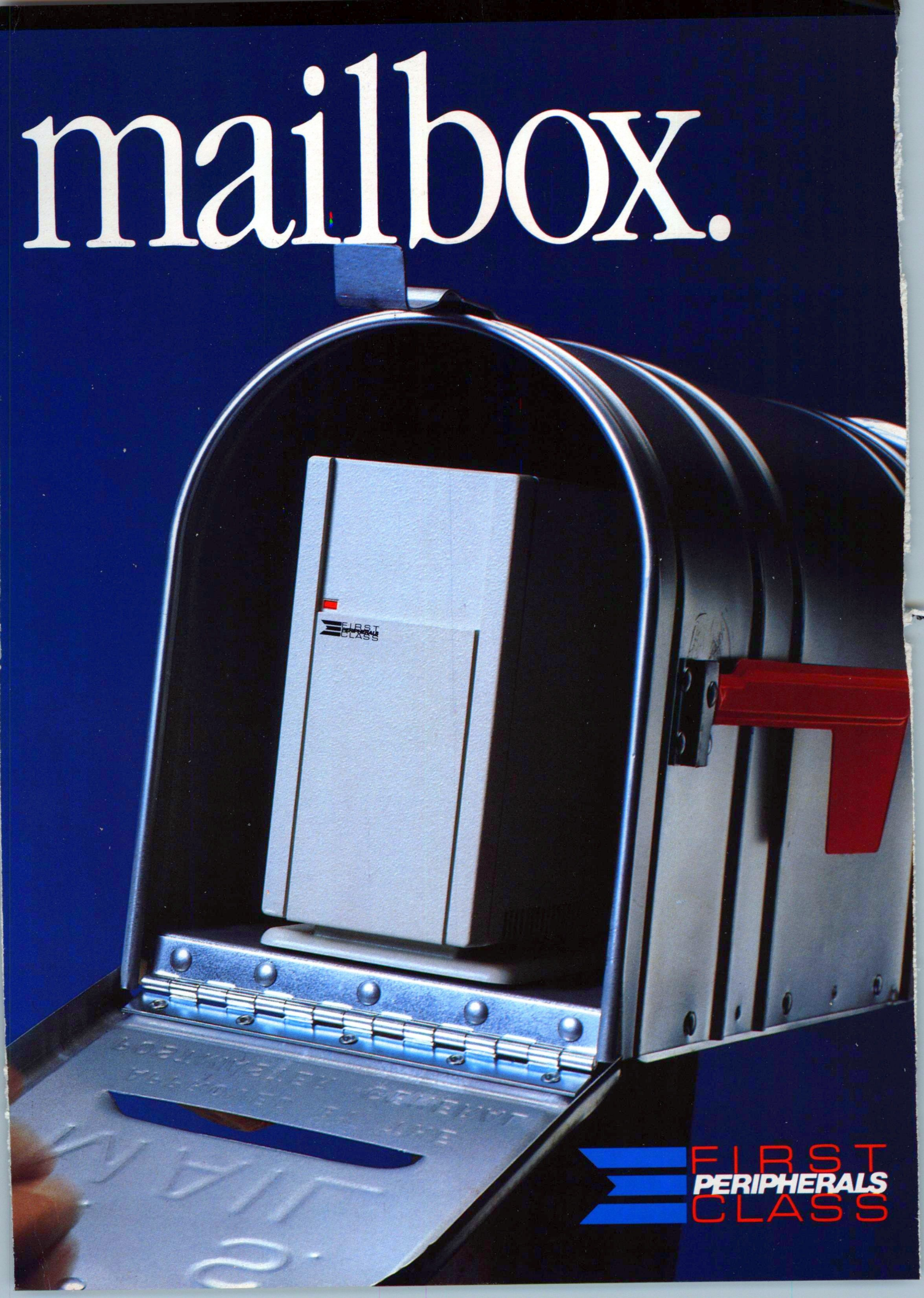
Our name is our commitment. First Class. That's why we offer a full one-year warranty on The Sider. No hassle. No nonsense. Full documentation, of course, accompanies the subsystem. A toll-free hotline is in place to answer any technical or service question you may have concerning The Sider's operation. But if there's any problem whatsoever that relates to the manufactured quality of the product, just return it for immediate replacement.

### Here's A First Class Idea: Order Now. 1-800-538-1307

We expect The Sider to sell like crazy. Because the product is right for today's Apple *II+* and *IIe* owners. And the price is, well, the price speaks for itself. You won't find an offer like this one anywhere in the industry for a long time to come.

So, act now. Complete the order form attached to this advertisement or call our toll free number. Harness the power of your Apple to the price/performance of The Sider. What a team!

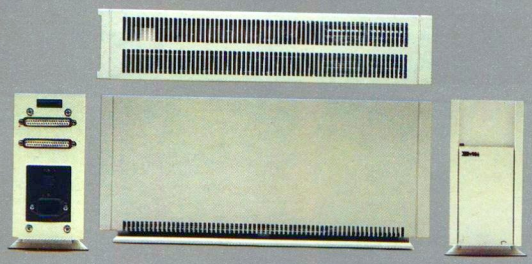
# mailbox.




FIRST
PERIPHERALS
CLASS

# The Sider:
## A First Class Engineering Achievement.

## *PUT ON YOUR SPECS AND READ OURS.*



The quality of a product is often made or lost in the fine print, the nitty-gritty engineering details. That's why we're proud to say that the technical-at-heart can indeed take heart at how we put together The Sider.

Take a look at these specifications.

**Operating Systems Supported**
- Apple DOS 3.3; ProDOS™ 1.0; Microsoft CP/M® 2.23; PCPI™ CP/M 1.0, 1.5, 2.0; Apple Pascal 1.1, 1.2

**Specifications**
- Formatted Capacity: 10 MB
- Sectors/Track: 32
- Bytes/Sector: 256

**AC Power Requirements**
- Source: 100–126 VAC, 220–240 VAC
- Line Frequency: 50/60 Hz (±2%)
- Power Consumption: 40 W

**Environmental Range**
- Temperature—Operating: 10°C to 40°C; Non-Operating: −40°C to 60°C
- Relative Humidity: 20% to 80% (without condensation)
- Altitude—Operating: −300 ft. to 10,000 ft. (−91 m to 3,048 m); Non-Operating: −300 ft. to 30,000 ft. (−91 m to 9144 m)
- Shock—Operating: 5 g; Non-Operating: 40 g
- Vibration—Operating: 2 g; Non-Operating: 3 g

**Physical Dimensions**
- Height: 7.5 in.
- Width: 3.375 in.
- Depth: 16.0 in.
- Net Weight: 11 lbs.

**Feature/Benefit Brief**
- Automatic data error detection and correction for high data integrity and faster system throughput.
- Internal diagnostics for increased subsystem reliability.
- Field-proven Winchester disk technology for better data integrity.
- Small footprint for increased workspace dynamics.
- Regulatory agency approval, meeting FCC Class B requirements.
- Menu-driven installation for increased user friendliness.
- Backup and restore utility for most operating systems, by volume, by operating system, by file, and by use of wild card backup.
- Flexible partitioning for optimizing operating system file sizes.
- Built-in modular drive expansion capability.
- Direct boot from hard disk, eliminating floppy drive booting.

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CP/M is a registered trademark of Digital Research, Inc.
PCPI is a trademark of Personal Computer Products, Inc.
The Sider is a trademark of First Class Peripherals.

FIRST CLASS PERIPHERALS

First Class Peripherals
P.O. Box 6187
Lehigh Valley, PA 18001
1-800-538-1307

# Hardware

## NEW PANASONIC KX-1091 PRINTER

This new printer features a 10 inch wide carriage, 120 character per second speed, Pica, Elite and condensed fonts, and high density bit graphics (1920 dots/line). The outstanding print is near letter quality, with proportional spacing, subscripting and superscripting as needed. The friction/tractor feed can handle up to 3-part paper. It is Epson RX-80, and IBM-PC dot matrix/graphics compatible. The print head has a 150 million character life and the ribbon a 4 million character life. The 8 bit parallel interface and 1K buffer are standard. A super printer at a reasonable price.

**Product Code: HPANPT** **Price: $369.00**

## RS232C SERIAL PRINTER OPTION CARD

Serial Printer Option Card for the Panasonic KX-P1090 printer listed above. This card converts the printer for serial operation and has an on-board 2K buffer and additional features. Requires a serial interface (such as the Versacard) for your computer.

**Product Code: HSERIN** **Price: $85.00**

## NEW PIXY3 PLOTTER
### by Mannesmann Tally Corporation

This precision three-pen plotter comes at an excellent price complete with software. Features:

- Prints on 8 ½ X 11" paper or transparencies
- Resolution 1800 vertical by 2450 horizontal (.004" increments)
- Repeatability .012" (same pen), .016" (pen-to-pen)
- Plotting speed 8"/sec (programmable)
- Built in character set (ANSI and foreign), Greek, 16 graphing symbols
- Character size selectable
- Circles, arcs, and automatic curve smoothing
- Relative scaling (Horizontal and vertical) software controllable
- Compatible with Imaginator 3D graphics package (not limited by Apple screen resolution)
- Graphics Builder compatible
- All control is via ASCII text commands
- You must supply interface and cable
- Five assorted pens included

| | APPLE PARALLEL | APPLE SERIAL | IBM PARALLEL |
|---|---|---|---|
| Product Code | HTPAP | HTPAS | HTPIP |
| A.P.P.L.E. Price | $299.00 | $299.00 | $299.00 |

## POWER SUPPLY

Does your Apple click and pop or come on slowly when you turn on the power switch? If so, you may need the A. P. P. L. E. replacement power supply. This power supply is compatible with the Apple II,II+,//e. It has a high capacity with 5 amps at 5V and 2 amps at 12V. A switch between 110/220 is built in and included is a 6ft power cord and power on light. 90-day warranty. This is a NEW (not rebuilt) unit.

**Product Code: HPOWSU** **Price: $85.00**

## PROMODEM 1200

A high performance modem at an affordable price. The ProModem 1200 operates at 0-300 and 1200 baud meeting the Bell 103 and 212A standard. It also recognizes the complete command set of the popular Hayes SmartModem 1200, assuring capability with existing communication software. The intelligent dialer saves you time and trouble. It can redial busy numbers automatically, wait for a second dial tone as you access a long distance dialing service and switch freely between pulse and tone; it even switches automatically to pulse dialing if your telephone exchange doesn't recognize tone dialing. A jack is provided for your telephone and the telephone is automatically locked out when the ProModem 1200 is in use, thus preventing loss of data. You will also appreciate the clean front panel display angled just right for easy viewing, the help menu, access to switch settings without opening the case and no bulky external power supply to fall out of your wall outlet. A built-in real-time clock can be set and read from your computer. Comes with automatic answering, built in diagnostics, status lights and a speaker for monitoring the progress of your dialing.

The standard unit comes with a modular cable for connecting ProModem 1200 to the telephone company and a DB-25S connector for the RS-232C cable going to your computer. You must supply the RS-232C serial interface in your computer and the RS-232C cable for connection between interface and modem. Versacard (HVRC) suggested for use with this unit.

**Product Code: HPRMOD** **Price: $399.00**

## PROMODEM 1200
### for the //c

Same as Promodem 1200 but with special cable for the Apple //c.

**Product Code: HPRO2C** **Price: $399.00**

## NEW PROMODEM 1200M

Same as Promodem 1200 but with special cable for the Macintosh and terminal software.

**Product Code: HMODM** **Price: $425.00**

## NEW PROMODEM 1200A

This modem installs entirely within your Apple II, II+, or //e. The circuitry is contained on two peripheral cards, one of which may be placed out of the way in the Apple case if your other slots are full. The Promodem 1200A is not only Hayes command compatible, but also has its own menu-driven terminal program built in. Includes most of the extra features in the Model 1200 such as intelligent dialing, auto-redial, and a speaker to monitor the progress of dialing. This is a terrific price, and you don't have to pay for a separate serial card.

**Product Code: HMODA** **Price: $349.00**

## PROTOTYPING BOARD 11"

Versatile professional board for large projects. All pins are identified by row and column and the I/O pins from the gold-plated edge connector are numbered. Accepts all standard I.C. sockets, and has convenient power and ground connections.

**Product Code: HP11** **Price: $21.00**

See page 22 for Product Reference Index

# Hardware

## REPEATERRRR

Install this handy circuit board between the keyboard and the encoder board to obtain "repeat on any key held down." If repeat key is depressed, repeat speed increases. Includes a very nice shift key modification kit. Requires the two piece keyboard.

**Product Code: HRPT** **Price: $25.00**

## RIGHT NOTCH

A handy tool that will double your disk storage capabilities. One bite from "Right Notch" and a sharp, clean square notch is positioned in just the right place allowing you to use the reverse side of the disk for your storage needs.

**Product Code: HRIGNO** **Price: $15.00**

## SUPER FAN II

Zener–Ray transient voltage suppressor and power filter squelches spikes up to 6000 Amps (even those caused by lightning) while responding up to 100 times faster than the Apple built–in filter. Removes air at 17 cubic feet per minute. Unit has lighted switch in front, two accessory plugs in rear and clips to Apple II, *II*e or monitor stand. The convenience and the efficient temperature stabilization will make your Apple last longer.

**Product Code: HFAN** **Price: $79.00**

## SOLID STATE DISK FLASH CARD

Slowed by your floppy drive? Save time and be more productive with this quick, low priced solid state disk emulator. Using RAM memory, this board plugs into any slot (except 0) and pretends to be a very fast floppy drive. Available as a single drive (144 K) or double (288 K); the double drive can be formatted as a single large DOS, Pascal or CP/M volume. Relatively low power consumption lets you use multiple solid state drives. Any disk with standard DOS can be copied into the SSD memory. Price includes one plug–in RAM memory disk emulator board, detailed instructions, diskette with program to automatically copy disks into "disk memory" and operating software for either DOS, CP/M or Pascal. One disk only comes with system. Please specify. (Requires an Apple II/*II*e, disk drive, DOS 3.3)

Upgrade for the 144 K SSD is also available and contains step–by–step instructions to update your 144 K SSD to a full 288 K. Kit includes memory chips and instructions. (Original warranty is maintained). **All operating system disks come with Flashcard. CP/M disk supports MicroSoft Z80 card only.**

### 144K SINGLE DRIVE

**Product Code: HSSS** **Price: $345.00**

### 144K UPGRADE KIT

**Product Code: HSSU** **Price: $200.00**

### 288K DOUBLE DRIVE

**Product Code: HSSD** **Price: $525.00**

## ULTRA ROM BOARD/ EDITOR, APB–102

Global Program Line Editor and Ampersand command utilities in EPROM. Ampersand commands include If, Then, Else and Print Using. Ultra Rom board is a slot independent ROM board with 8 sockets, each accommodating a 2716 or 2732 EPROM, interchangeable with no modifications. Each 2716 or 1/2 2732 is over–laid into the 2K I/O memory space from $C800 to $CFFF. Onboard firmware controls bank switching and facilitates jumps and calls between banks. Thus, up to 32 K or resident ROM space is provided, that does not impinge on the main board or language card memory space. The firmware automatically turns the board off after access and can co–exist with any other I/O board that follows Apple convention. For special applications the resident firmware is also changeable by the user. Works on Apple II+ and *II*e.

**Product Code: HURB** **Price: $149.00**

## UNIVERSAL SERIAL INTERFACE for Epson MX series printers by HanZon Computer Enhancements

With this special serial interface card which mounts easily inside the Epson printers, you may switch select two modes of operaton. In the Imagewriter mode, your Epson MX series printer connected to your Apple *II*c or Mac will behave like an Apple Imagewriter printer. In standard mode, your printer will accept the regular Epson MX series printer codes. A 2000 byte buffer is included onboard. Supports RS–232 protocols up to 19.2 Kbaud with a choice of hardware, XON/XOFF, or ACK/NAK handshaking.

**Product Code: HSEREM** **Price: $99.00**

## VIEWMASTER 80 COLUMN CARD

A total Videx Videoterm compatible 80–Column card. Features 80 characters by 24 lines with a sharp 7 x 9 dot matrix. An on–board 40/80 soft video switch with manual 40 column override. Fully compatible with all Apple languages and software (some may require pre–boot disk). Board features low power consumption through the use of CMOS devices and all connections on the card are made with standard video connectors, no cables soldered to the board. **Not Videx preboot compatible.** **Limited availability.*

**Product Code: HVIE80** **Price: $149.00**

## VIDEX UNIPRINT PARALLEL PRINTER INTERFACE

A single graphics printer interface compatible with over 25 printers! Works with Apple DOS, ProDOS, Pascal, Logo, and CP/M in Text mode. Special commands are available to control page width, length, and left margin. In graphics mode HIRES graphs and pictures (Double HIRES on the *II*e) are easily printed (even in color on the IDS Prism printer). Parallel cable and extensive documentation included.

**Product Code: HVIDIN** **Price: $74.00**

## VERSACARD

Four of the most popular Apple peripheral functions on one card! Provides (1) 6850 ACIA Serial interface, (2) Eight–bit Parallel port, (3) Real–time Calendar/Clock, and (4) BSR Control interface. On–Board EPROM includes a terminal program. The VersaCard is fully compatible with Apple Pascal, CP/M, and BASIC, and no special disks or modifications are needed! Includes documentation and warranty card. (Note: connecting cables and ultrasonic Home Controller, and Graphitti Graphics Chips control are not included, but available separately.)

**Product Code: HVRC** **Price: $150.00**

## VERSACARD WITH PARALLEL PRINTER CABLE (6′ long)

**Product Code: HVRC1** **Price: $160.00**

## VERSACARD WITH SERIAL CABLE (6′ long)

| | | | |
|---|---|---|---|
| * | Male | HVRC2M | |
| * | Female | HVRC2F | **Price: $160.00** |

## VERSACARD WITH SERIAL CABLE (1′ long)

| | | | |
|---|---|---|---|
| * | Male | HVRC3M | |
| * | Female | HVRC3F | **Price: $160.00** |

## VERSACARD ROM

Add Graphitti power to your Versacard. This firmware chip makes it a snap to transfer Apple graphic and text screens to printer without needing to load special software routines. In addition, you may send printer ESCape codes as control characters, set margins, line and page length, toggle high–bit, set video echo and linefeeds. Includes a special manual. Requires Applesoft in ROM for full graphics capability.

*Please specify printer type by selecting appropriate Product Code.

| | |
|---|---|
| **HVPREP** | Epson, Panasonic |
| **HVPRCI** | C.Itoh |
| **HVPRID** | IDS |
| **HVPROK** | Okidata, Prowriter, NEC |
| **HVPRAP** | Apple Dot Matrix |

**Product Code: HVPRAP** **Price: $30.00**

## CABLES ONLY

## VERSACARD PARALLEL CABLE (6′ long)

**Product Code: HVPC** **Price: $20.00**

## VERSACARD SERIAL CABLE (6′ long)

| | | | |
|---|---|---|---|
| * | Male | HVSLM | |
| * | Female | HVSLF | **Price: $20.00** |

## VERSACARD SERIAL CABLE (1′ long)

| | | | |
|---|---|---|---|
| * | Male | HVSSM | |
| * | Female | HVSSF | **Price: $20.00** |

## ZARDAX KEYBOARD CONNECTOR

The Zardax keyboard connector is required for use of Apple II+ computers with Zardax. The connector comes with straightforward installation instructions, no soldering required. Does not interfere with game paddle controls.

**Product Code: HZARKY** **Price: $7.00**

***Orders only, 24hr. toll free***
***1-800-426-3667***

See page 22 for Product Reference Index

See page 22 for Product Reference Index

# Publications

## ANTHOLOGY VOLUMES

Each disk contains the all the programs found between the pages of Call –A.P.P.L.E. magazine for a six month period, unless otherwise indicated (see below). Great way to obtain terrific programs and utilities without the bother and worry of typing them in correctly. Consult the individual issues or Peeking Compendiums for program documentation as these disks are not stand–alones.

**Price: $12.50**

**VOL 1 (Jan – Jun '79)***(SA1)*
**VOL 2 (Jul – Dec '79)***(SA2)*
**VOL 3 (Jan – Jun '80)***(SA3)*
**VOL 4 (Jul – Dec '80)***(SA4)*
**VOL 5 (Jan – Jun '81)***(SA5)*
**VOL 6 (Jul – Dec '81)***(SA6)*
**VOL 7 (Jan – Jun '82)***(SA7)*
**VOL 8 (Jul – Dec '82)***(SA8)*
**VOL 9a (Jan – Mar '83)***(SA9A)*
**VOL 9b (Apr – Jun '83)***(SA9B)*
**VOL 10a (Jul – Sep '83)***(SA10A)*
**VOL 10b (Oct – Dec '83)***(SA10B)*
**VOL 11a (Jan – Mar '84)***(SA11A)*
**VOL 11b (Apr – Jun '84)***(SA11B)*
**PASCAL 81 (Jan – Dec '81)***(SPA1)*

## *Call -A.P.P.L.E.* IN DEPTH

*Diskettes containing all programs published in Call –A.P.P.L.E. In Depth are also available.*

## VOL 1, "ALL ABOUT APPLESOFT"

Comprehensive and detailed tour through the Applesoft language – from the construction of BASIC, variables, high resolution graphics subroutines to extending the language with Ampersand functions. Publication includes many useful application and utility programs designed to promote your understanding of Applesoft and how it can work for you. Recommended for all Apple users, although may be a bit heavy going for beginners. Now in its 2nd Printing!

**Product Code: PID1** **Price: $7.00**

## "ALL ABOUT APPLESOFT" DISKETTE

**Product Code: SIN1** **Price: $16.50**

## VOL 2, "ALL ABOUT PASCAL"

Wide range of new and useful programs and "in–depth" articles specializing in the Apple Pascal language. Switch to and from BASIC and the Pascal environment, decode a compiled program, edit your own graphics, format text and programs, research the subject with the expanded and up–to–date bibliography, and more! Almost everything you wanted to know about Apple Pascal but didn't know where to look. Also contains supplemental information for beginners.

**Product Code: PID2** **Price: $11.00**

## "ALL ABOUT PASCAL" DISKETTES

**Product Code: SIN2** **Price: $20.00**

## VOL 3, "ALL ABOUT DOS"

"All About DOS" contains 288 pages of DOS tutorials and utility programs. "All About DOS" is a fine addition to your A.P.P.L.E. library.

**Product Code: PID3** **Price: $13.50**

## "ALL ABOUT DOS" DISKETTES

**Product Code: SIN3** **Price: $15.00**

## VOL 4, "ALL ABOUT APPLEWRITER //e"

Make Applewriter work for you. A technical treatise on Applewriter //e. 19 chapters include full descriptions of each facet, annotating each of four work areas, memory management, zero page, entry points, WPL, modifications, etc. Full descriptions of each subroutine, indexed by address. Not for Beginners.

**Product Code: PID4** **Price: $12.50**

## BOUND SET OF *Call -A.P.P.L.E.* ISSUES

Complete set of the individual issues of our magazine for the indicated calendar year. Each is fully indexed for easy reference and binder punched for easy handling.

## 1982 CALENDAR YEAR

**Product Code: PPK5** **Price: $18.50**

## 1983 CALENDAR YEAR

**Product Code: PPK6** **Price: $18.50**

## 1984 CALENDAR YEAR

**Product Code: PPK7** **Price: $18.50**

## THE APPLE II BASIC HANDBOOK

This reference book lists and explains the entire Applesoft and Integer BASIC vocabularies. All of the DOS commands are included. Sample programs show what each command does.

**Product Code: PAPHDB** **Price: $12.95**

## Call -A.P.P.L.E. BACK ISSUES

Shipping weight for each issue is 8 oz.

| CODE | ISSUE | PRICE |
|---|---|---|
| MM–A 80 | March/April 80 | $2.00 |
| MMAY 80 | May 80 | $2.00 |
| MJUN 80 | June 80 | $2.00; |
| MN–D 80 | Nov/Dec 80 | $2.00 |
| MJAN 81 | January 81 | $2.50 |
| MM–A 81 | March/April 81 | $2.50 |
| MJUN 81 | June 81 | $2.50 |
| MJ–A 81 | July/Aug 81 | $2.50 |
| MSEPT 81 | September 81 | $2.50 |
| MOCT 81 | October 81 | $2.50 |
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| MDEC 82 | December 82 | $2.50 |
| MJAN 83 | January 83 | $2.50 |
| MFEB 83 | February 83 | $2.50 |
| MMAR 83 | March 83 | $2.50 |
| MAPR 83 | April 83 | $2.50 |
| MMAY 83 | May 83 | $2.50 |
| MJUN 83 | June 83 | $2.50 |
| MJUL 83 | July 83 | $2.50 |
| MAUG 83 | August 83 | $2.50 |
| MSEP 83 | September 83 | $2.50 |
| MOCT 83 | October 83 | $2.50 |
| MNOV 83 | November 83 | $2.50 |
| MDEC 83 | December 83 | $2.50 |
| MJAN 84 | January 84 | $3.00 |
| MFEB 84 | February 84 | $3.00 |
| MMAR 84 | March 84 | $3.00 |
| MAPR 84 | April 84 | $3.00 |
| MMAY 84 | May 84 | $3.00 |
| MJUN 84 | June 84 | $3.00 |
| MJUL 84 | July 84 | $3.00 |
| MAUG 84 | August 84 | $3.00 |
| MSEPT 84 | September 84 | $3.00 |
| MOCT 84 | October 84 | $3.00 |
| MNOV 84 | November 84 | $3.00 |
| MDEC 84 | December 84 | $3.00 |

## THE APPLE ALMANAC

This reference volume brings together in one place ASCII charts, opcodes, PEEK and POKE charts plus vital DOS information, graphics chart and algorithms. This is not a general tutorial for beginners, but is better suited for the intermediate to advanced computer user. A list of useful sources for learning about the various aspects of the Apple is included in case you have gaps in your knowledge about your computer.

**Product Code: PAPALM** **Price: $17.50**

## THE APPLE II CIRCUIT DESCRIPTION

Includes schematic diagrams redrawn by function. Each function of the Apple is explained in adequate detail. A great book for technicians and those who wish to study a little to better understand Apple operation. Apple II and II+ only.

**Product Code: PACD** **Price: $18.50**

## THE APPLE CONNECTION

This book teaches you to program and connect your Apple to real appliances and devices. It will help you sharpen your BASIC programming skills as you learn elementary interfacing techniques. In particular, you will learn how to use PEEK and POKE instructions in BASIC, Apple I/O slots, transducers and solid–state relays. Also, how to perform digital–to–analog and analog–to–digital conversions, and how to build real applications such as a home security system and a complete temperature monitoring system.

**Product Code: PAPCON** **Price: $12.95**

## BENEATH APPLE DOS

Perfect companion to DiskPak 6B–16 and the Apple DOS manual. Comprehensive book continues where the DOS manual left off and details all versions of the Apple Disk Operating System and how it may be modified OR enhanced to suit your applications. A must for the programmer! **Updated for the *//e*.**

**Product Code: PBAD** **Price: $17.00**

## COMPUTER PLAYGROUND

This illustrated workbook is for the child who wants to make the computer "do" something. It contains over 40 activities appealing to children and geared to their level of understanding. This is not a book on "What you can do with your Apple." Rather, it is a book on how to use BASIC with an Apple. Exercises include puzzles, math quizzes and word games. The illustrations throughout the book are suitable for coloring. For children grades 3–7.

**Product Code: PPLGRO** **Price: $8.50**

## /// CHEERS!
### A Quarterly Diskette Magazine

A bold new concept in publishing, /// Cheers brings news, learning, entertainment and technical support to Apple /// owners through disk–based articles and programs. The magazine supports the Boats™ window–oriented environment, allowing the user to interactively view information on the screen. Alternately, the magazine can be sent to a printer for more traditional reading. Includes two diskettes. Requirements: an Apple /// or ///+ — screen viewing requires 256K of memory.
$40.00 for one year subscription.

$12.50 for a single issue.
**Single issue product codes:**

| | |
|---|---|
| **SCHE1** | **Summer 1984** |
| **SCHE2** | **Fall 1984** |
| **SCHE3** | **Winter 1985** |
| **SCHE4** | **Spring 1985** |

(shipping weight 1 oz. each)

See page 22 for Product Reference Index

# Publications

## THE ELEMENTARY APPLE

"This book is intended to help you operate your new Apple II+ computer, get started programming and make life easier with your computer." Excellent teaching and reference work on the Applesoft language presents material in a logical, step–by–step manner that builds on each previous lesson to give a full comprehension of the Apple BASIC language. Illustrated with great cartoons, the book takes you from "Hooking up your Apple" to writing "Your First Program" to adding graphics, disk commands, and other options. Concludes with a valuable "Programs, Hints, and Helps" section. "The Elementary Apple" deserves a place in your computer library next to your Apple computer!

**Product Code: PELA** **Price: $11.00**

## GOING PLACES WITH THE APPLE //c

This book is recommended reading for the person contemplating the purchase of a personal computer, especially the Apple //c. Not only is Apple's smallest computer described, but it is also contrasted with its predecessors in the Apple II family, in addition to computers offered by Apple's major competitors. This discussion is factual and reasonably balanced without being overly technical. The book is also a creditable introduction to computer literacy, covering basic terminology as well as the usefulness of the computer for a variety of jobs in the home. Some exemplary programs and applications are discussed in detail (word processing, spreadsheet, databases, telecommunications, entertainment), and the purpose of add–on equipment is discussed. There are even tips for choosing educational software. Overall, this book will be most valuable as a painless introduction rather than a comprehensive buyer's guide.

**Product Code: PAPP2C** **Price: $3.25**

## IMAGINATOR SOURCE LISTING

Over 100 pages of commented source listing for 3D program: IMAGINATOR. It lets the user see program logic flow, how graphics were done, and the complete source listing for the true computer hacker.

**Product Code: PIMAGS** **Price: $30.00**

## PEEKING AT *Call -A.P.P.L.E.*

This annual publication collects all the articles of *Call –A.P.P.L.E.* magazine for the given year into one volume. Especially recommended for anyone about to become an Apple owner, future or present member of A.P.P.L.E. Even better when combined with the Anthology Volumes for the corresponding year!

## VOL 2, 1979 COMPENDIUM

**Product Code: PPK2** **Price: $10.00**

## VOL 3, 1980 COMPENDIUM

**Product Code: PPK3** **Price: $15.00**

## INTRODUCING THE APPLE MACINTOSH

This book explains the concepts of the desktop and how to think about the Mac desktop concept to improve your productivity. Whether you have a Mac on hand or are thinking about buying one, this handy guide will serve you well.

**Product Code: PMACIN** **Price: $10.50**

## SOFTWARE AUTHOR'S GUIDE

This comprehensive guide contains hints from over 300 software companies on how to publish your own software. Compiled from a questionnaire sent to publishers world–wide, this book contains information on where to send material and how to submit it. Useful tips are included, such as "familiarize yourself with the products and style of writing of a certain company before submitting a product for publication . . . look at all competition after conceiving an idea but prior to coding . . . be patient . . .".

**Product Code: PAUTGU** **Price: $17.50**

## USING 6502 ASSEMBLY LANGUAGE

This simple and understandable book "was written with the beginner in mind" and covers not only the theory behind 6502 machine language, but the practical aspects and how they apply to you and your Apple. Contains complete Sweet 16 tutorial, many illustrations, examples, and exercises to advance you from a "beginner" to an "intermediate" assembly language programmer.

**Product Code: PU65** **Price: $17.00**

## WHAT'S WHERE IN THE APPLE

Atlas and gazetteer of the Apple II memory for the BASIC programmer. Each entry describes a single memory location, given in decimal and hex, and (if applicable) the name of the symbolic label, followed by a brief explanation of the routine which resides there. A definite must for those wanting a PEEK's and POKE's dictionary and with an insatiable appetite for more Apple information.

**Updated for the //e and DOS 3.3.**

**Product Code: PWWA** **Price: $17.00**

## THE GUIDE

Supplement to the original edition of "What's Where In The Apple."

**Product Code: PWW2** **Price: $8.00**

## WOZTALKS VIDEO CASSETTE

Ninety–minute VHS format video cassette of Apple Computer's Steve Wozniak during the October '81 meeting. "Woz" talks about the early history of the Apple, some of its technical development, and its future.

**In limited supply, order now!.**

**Product Code: PWTA** **Price: $27.50**

*Orders only, 24hr. toll free*
*1-800-426-3667*

NEW **MacCOVERS**

Attractive vinyl, cloth–backed dust covers for the Macintosh, the Mac keyboard and printer. Aids in static prevention and kid protection. 3 piece set for the Mac, keyboard, and Imagewriter.

**Product Code: HMCCVR** **Price: $25.00**

NEW **MEDIA MATE**

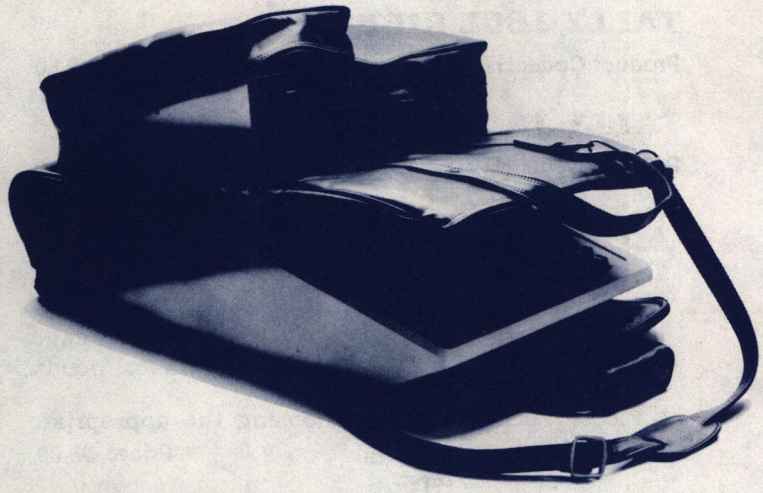
For protecting, organizing and storing your Macintosh diskettes. Sturdy high–impact construction, attractive smoked, see–through cover, adjustable tab dividers, and case on case stackability. Holds up to 50 3½″ diskettes.

**Product Code: HDSMT3** **Price: $12.99**

**FLIPSORT**

Attractive, functional disk storage system with capacity for 75 5¼″ diskettes. Contains molded index with dividers. Cover protects disks from dust contamination. Comes in a smoke color with front carrying handle.

**Product Code: HFLS** **Price: $22.50**



**SOFTCASE**

This soft cover, light, durable carrying case makes transporting your Apple and two disk drives easy and SAFE. Three eighths inch padding protects your entire Apple from bumps and bruises with extra padding around corners and keyboard. The SoftCase is made of attractive, light brown simulated leather and features two counter–zip zippers, a strong carrying handle plus a durable shoulder strap. SoftCase also offers pockets inside for diskettes, manuals and two large exterior zip pockets hold and protect your disk drives atop your Apple. Great for taking your Apple to Grandma's house.

**Product Code: HSOFTC** **Price: $39.00**

A carrying case for your Macintosh made of masonite, thick high–density foam, and heavy Cordura® . Contains pockets for accessories, papers and manuals, and room for an extra disk drive and modem. Can be carried by shoulder sling, like a suitcase or by hideaway backpack straps. Burgundy color.

**Product Code: HMACPK** **Price: $64.95**

**PRINTPAK**

A soft case for the Imagewriter® printer made of high density–foam and Cordura® . Can be carried by shoulder sling, like a suitcase or attached to the MacPak while carried as a backpack. Burgundy color.

**Product Code: HPRPAK** **Price: $39.95**

**DISK BANKS**

Store and protect your valuable diskettes in this unique and versatile disk filing system. Each "bank" holds up to 10 diskettes and features an adjustable slide–out drawer, convenient interlocking grooves on sides & top for stacking and expansion, and sturdy, safe storage of your magnetic media.

**Product Code: HDBA** **Price: $4.50**

See page 22 for Product Reference Index

# Accessories

## BULK BLANK DISKETTES
### (Brand Name Boxed)

Quality blank diskettes are 5¼" single–sided double–density with mylar hub ring for more durability and longer disk life. Box of 10.

**Product Code: HGEN10** **Price: $15.00**

**Order 10 boxes for $125.00!**

## VERBATIM DATALIFE

Double–density with Verbatim labels, jackets, and write–protects. Box of 10.

**Product Code: HVEB** **Price: $25.00**

## BASF 3.5" MICRO FLEXYDISK

Single–sided 3.5" micro–floppy disk with a **lifetime guarantee**. Box of 5.

**Product Code: HBASF** **Price: $22.50**

## MEMOREX 3.5" MICRO-FLOPPY DISK

Single–sided 3.5" micro–floppy disk. Box of 10.

**Product Code: HDMEMO** **Price: $44.00**

## PIXY3 PLOTTER PENS

Water–base ink pens for standard paper.

**Price:** $10.00 per set.

| | |
|---|---|
| **5 Black** | **HPLBLK** |
| **5 Blue** | **HPLBLU** |
| **5 Red** | **HPLRED** |
| **5 Green** | **HPLGRE** |
| **5 Multicolor** | **HPLPEN** |

**(1 Green, 1 Violet, 1 Brown, 1 Orange, 1 Pink)**

Oil–base ink pens for glossy paper and transparencies.

**Price:** $12.50 per set.

| | |
|---|---|
| **5 Black** | **HPNBLK** |
| **5 Blue** | **HPNBLU** |
| **5 Red** | **HPNRED** |
| **5 Green** | **HPNGRE** |
| **5 Multicolor** | **HPLPTR** |

**(1 Green, 1 Violet, 1 Brown, 1 Orange, 1 Pink)**

## PIXY3 PLOTTER PAPER

Heavy weight Glossy plotter paper for best results on final drafts, 100 sheets for $8.50.

**Product Code: HPLGPA**

## PIXY3 TRANSPARENCY SHEETS

For presentation graphics made on the PIXY3 plotter: 50 sheets for $30.00.

**Product Code: HPLTRA**

## *Call — A.P.P.L.E.* POSTER
### February '84 Cover

The "Apple tree" *Call — A.P.P.L.E.* cover from February '84 has indeed become a classic. Produced in lavish four–color, this poster measures 20 *x* 25, and is a handsome addition to home, office, or computer area. Suitable for framing.

**Product Code: HPOST2** **Price: $2.95**

## PANASONIC KX–P1090 PRINTER RIBBONS

**Product Code: HPANRI** **Price: $14.00**

## PROWRITER PRINTER RIBBONS

**Product Code: HPRC** **Price: $4.95**

## TALLY 160L RIBBON

**Product Code: HTRC** **Price: $12.50**

## TALLY 180L RIBBON

**Product Code: HTRI** **Price: $17.00**

## A.P.P.L.E. T-SHIRT

Proclaim your pride in the world's largest Apple user group. Just in time for summer. Silkscreened in four–color, A.P.P.L.E. T–shirts make great gifts for friends. Sizes S, M, L, XL.

*** Please specify size by choosing the appropriate Product Code.** **Price: $5.00**

| | |
|---|---|
| **S** | **HTSHS** |
| **M** | **HTSHM** |
| **L** | **HTSHL** |
| **XL** | **HTSHX** |

## TYPING AID

Plastic stand which is a must for any programmer who spends a lot of time entering program listings or information from various sources. The "Typing Aid" has an adjustable stand to hold publications or listings of any size and is engraved with the *Call — A.P.P.L.E.* logo.

**Product Code: HPAG** **Price: $13.00**

# Information

## HOW TO BECOME A FULL MEMBER OF A.P.P.L.E. CO-OP

To join the CO-OP, please give us your full name and mailing address. As a member of the CO-OP you will be eligible for patronage dividends. Please include your Social Security Number and/or Federal Tax Identification Number with your application as we are required to report the amount of the dividend to the IRS. Also include the appropriate fee with your application (usually $51 US. Please see exceptions below). Yearly dues are $26 (use Product Code FREN26). In addition, each new member is assessed an additional $25 the first year (use Product Code FAPP). This one-time fee contributes to the improvement of our facilities and expansion of our member services.

**Exceptions:** A Call—A.P.P.L.E. subscription with third class mailing is included with your membership. Those wishing faster first-class service as well as foreign members are assessed an extra postage charge for the more expensive service. (See the Additional Postage chart)

## ANNUAL MEMBERSHIP RENEWAL

The annual membership renewal is $26.00 plus whatever extra postage charge there may be for delivering your magazine (normally none in the Continental US — see the Additional Postage chart). We do not issue a new card each year. If you have lost yours and want a new one, see "Lost Membership Cards" below.

## MAGAZINE SUBSCRIPTION WITHOUT CO-OP MEMBERSHIP

You may subscribe to the magazine without becoming a member. The yearly subscription is $21 plus extra postage if necessary (Use Product Code FSUB21, and see the Additional Postage Chart).

## FOR FOREIGN MEMBERS ONLY

When joining or renewing, please be sure to allow for the necessary extra postage in your payment. All payments should be made in US funds. Sorry, but at present we do not have an export license to ship hardware outside the U.S.

## HOW TO ORDER PRODUCTS

Our staff is dedicated to getting your orders to you as quickly as possible. If you supply accurate and clear information with your order, it usually results in faster order processing (and keeps us happy too!). Most orders will arrive at your door within three weeks of the time they are received. Occasionally, demand temporarily outstrips our supply on hand. When this happens, backorders are filled in the order they are received. Our normal procedure is to process an order immediately. This includes cashing checks or submitting VISA or MasterCharge slips for payment. If an item has been in short supply for a long time or is new and we don't have a firm availability date, the checks or slips are held in a special file. In either case, the orders go into the backorder queue and are shipped in the order received. We appreciate your patience when this occurs.

Members accustomed to ordering from us should note that there is now a charge for domestic shipping. We feel that overall it will result in fairer pricing. Similarly, since small orders cost nearly as much as larger ones to process, there is a $3.00 handling charge on orders under $25 (Product Code FHDLCH), in addition to the member paid shipping charges. Our goal is to bring you exceptional values, but to make it work, everyone must pay their fair share.

## METHODS OF PAYMENT

All orders must be prepaid in US funds by check, money order, or a bank draft drawn on a US bank, or by Visa or MasterCard payable in U.S. funds with your card number and expiration date.

## EXPRESS SERVICE

Need your order in a BIG hurry? For a $25 special handling fee (Use Product Code FSPSVC), we will assign a person to hand-carry your order through the system and ready it for shipment via UPS Blue Label. Please see the chart for the additional UPS Shipping charge.

## WHERE TO PLACE YOUR ORDER

**TELEPHONE:** Please try to have all the pertinent information assembled before you call.

TOLL FREE NUMBER, 1-800-426-3667 Available 24 Hours, seven days a week: Use this number for placing orders only. The operators cannot answer detailed questions about the products or their availability.

A.P.P.L.E. CO-OP OFFICE (206) 872-2245: Available 9 AM to 4 PM Pacific Time, Monday through Friday. Ask for the Customer Service Desk. Call this number if you want to check on the status of your order. If you wish to know more about a particular product, call the Hotline at 206-872-9004 9 AM to 3 PM Pacific Time.

**THE SOURCE:** You may leave your order with us on our system account ST1570 and we'll take it from there! Be sure to include all credit card information, member number, expiration date, your name, shipping address, etc.

**MAIL:** Please take a few extra moments to print or type your order information LEGIBLY. You would be surprised at how many orders get help up while we try to break someone's hand-written code!

## TROUBLESHOOTING AIDS!!!

## LOST MEMBERSHIP CARD?

A replacement membership card may be purchased for $5.00. (Use Product Code FMCU)

## MISSING MAGAZINE?

We recognize that occasionally, a magazine may get lost in the mail. But we have found that our magazines, like other items bulk mailed, are quite variable in their transit time. We ask that you be patient. If, when you notify us, your subsequent issue has arrived, and your address was correct in our files at the time the first issue was mailed, we will gladly replace the missing issue free of charge. Please give us at least six weeks advance notice when you move so that you will not miss any issues of the magazine. Sorry, we cannot offer a free replacement if we have not received a timely change of address notice.

## DEFECTIVE OR UNSATISFACTORY PRODUCT?

If you are not satisfied with an A.P.P.L.E. product, return it within 15 days for a full refund. Returned products qualifying for a full credit, replacement, or refund must be returned with the original invoice, all packing, manuals and warranty cards. We urge you not to mail in any Warranty Registration card until you are sure that you will keep the product. For amounts under $100 we request that you accept a credit toward future purchases rather than ask for a cash refund. Your cooperation in this regard will help us hold prices down.

Items under warranty that you wish to return for repair/replacement MUST HAVE A RETURN AUTHORIZATION NUMBER (Call 206-872-2245). We'll try to help you solve the problem over the phone if we can.

## ABOUT OUR PRICING

We maintain the lowest possible prices while still providing initial product testing and good support for our products. Through volume purchases, we can often achieve more favorable terms with our suppliers when we restock our inventory. When this happens, the savings can be passed on to the members. Please understand that if you purchased an item at the higher price, it reflects our actual cost for the product. For this reason, we cannot make the lower price retroactive for people who have already purchased the item.

**This price list supercedes all others.**

Call our new **TOLL FREE NUMBER: 1-800-426-3667 FOR A.P.P.L.E. ORDERS ONLY!** For information and order check, call our regular number (206-872 – 2245) between the hours of 9am and 4pm, Pacific time, Monday through Friday and ask for the Customer Service Desk. Be sure to have the information requested above ready.

SOFTWARE

| PRODUCT NAME | INDEX CODE. | USE ON | PROD. CODE | PRICE | LBS. | OZ. |
|---|---|---|---|---|---|---|
| LIFESAVER | DsUt | +,e | SDISRE | $21.00 | 0 | 2 |
| DISK ANALYZER 1.3 | DsUt | +,e | SDOSAN | $12.50 | 0 | 2 |
| ZAPT | DsUt | +,c,e | SZAPT | $12.50 | 0 | 2 |
| SCRAMBLER | DsUt | +,e | SSCRAM | $12.50 | 0 | 2 |
| UTILITY DISKPAK 6B-16 | DsUt | +,e | SD6B | $18.50 | 0 | 2 |
| DIRECTORY TITLE WRITER | DsUt | +,e | STITWR | $15.00 | 0 | 2 |
| PROZAP | PdUt | +,c,e | SPZAP | $25.00 | 0 | 3 |
| APPLESOFT PROGRAM EDITOR | ApUt | +,c,e | SAPE | $30.00 | 0 | 4 |
| PROGRAM LINE EDITOR | ApUt | +,e | SPLE | $15.00 | 0 | 3 |
| AP FILE | ApUt | +,e | SAPF | $18.50 | 0 | 2 |
| AMPERMANAGER V2.0 | ApUt | +,c,e | SAMP | $22.50 | 0 | 8 |
| THE APPLESOFT CARPENTER | ApUt | +,e | SCAR | $18.50 | 0 | 4 |
| SYMBOL SYMON | MlUt | +,e | SSYM | $20.00 | 0 | 3 |
| BIG MAC.C | MlUt | +,c,e | SMACC | $40.00 | 1 | 0 |
| GRAFMAGIC | GrUt | +,c,e | SGRAFM | $12.50 | 0 | 2 |
| HIGHER FONTS 1 | GrUt | +,c,e | SHFI | $13.00 | 0 | 2 |
| HIGHER TEXT PLUS | GrUt | +,c,e | SHTP | $27.50 | 0 | 4 |
| HIGHER GRAPHICS II | GrUt | +,c,e | SHIGRA | $15.00 | 0 | 8 |
| THE FONT ALBUM | GrUt | +,c,e | SFTALB | $12.50 | 0 | 2 |
| AP GRAPHICS | GrUt | +,e | SFLR | $17.00 | 0 | 4 |
| GRAPHICS BUILDER | GrUt | +,e | SGRABU | $12.50 | 0 | 2 |
| APGRAPHICS/GRAPHICS BUILDER | GrUt | +,e | SPGRPH | $25.00 | 0 | 6 |
| MAC THE KNIFE VOL#1 | GrUt | Mac | SMCKNF | $29.00 | 0 | 9 |
| DICE | Ut | + | SDIC | $12.50 | 0 | 2 |
| SOFT SEVENTY | Ut | +,e | SS70 | $20.00 | 0 | 3 |
| EZ-PILOT | EdUt | +,e | SEAP | $28.50 | 0 | 4 |
| TURTLE SOFT | Gr | +,e | STUR | $22.50 | 0 | 8 |
| AP TEST | Diag. | +,c,e, | SAPT | $18.50 | 0 | 2 |
| DRIVE ANALYZER DISKETTE | Diag. | +,e | SDAN | $20.00 | 0 | 9 |
| IMAGINATOR | Gr | +,e | SIMAGI | $50.00 | 2 | 0 |
| LISA QUICKDRAW-DEMO PROGRAM | Gr | LISA | SQDRAW | $39.50 | 0 | 2 |
| APMAIL II V3.0 | Apl | +,e | SAM3 | $25.00 | 0 | 3 |
| APMAIL.PRO | Apl | +,c,e | SAPMPR | $35.00 | 0 | 3 |
| APMAIL II V3.0 TO APMAIL.PRO UPDATE | * | * | SAPMUP | $10.00 | 0 | 2 |
| THE SCHOOLHOUSE GRADER | Apl | +,c,e | SGRADE | $12.50 | 0 | 2 |
| THE SPREADSHEET V2.0 | Apl | +,c,e | STSS | $65.00 | 2 | 0 |
| DOLLARS AND $ENSE | FinApl | +,e | SDAS2E | $75.00 | 2 | 0 |
| DOLLARS AND $ENSE | FinApl | e,c | SDAS2C | $83.50 | 2 | 0 |
| DOLLARS AND $ENSE | FinApl | Mac | SMCDAS | $112.00 | 2 | 0 |
| ZARDAX | Wp | +,c,e | SZARII | $160.00 | 2 | 0 |
| ZARDAX | Wp | III | SZARDA | $160.00 | 2 | 0 |
| MICROWRITER IIe | Wp | e | SMICWT | $12.50 | 0 | 2 |
| MICROWRITER II+ | Wp | + | SUWTR+ | $12.50 | 0 | 2 |
| FARWORD | Wp | +,e | SFARWO | $12.50 | 0 | 2 |
| MULTI-TREIVE | Db | +,c,e | SMUL | $50.00 | 0 | 9 |
| VOLKSFILER | Db | +,c,e | SVOLKS | $12.50 | 0 | 2 |
| MORTGAGES,DEPRECIATION, AND FINANCIAL CALCULATIONS | FinApl | +,e | SMORTG | $12.50 | 0 | 2 |
| STAR GAZER'S GUIDE | Ed | +,c,e | SSTAGU | $15.00 | 0 | 8 |
| ELF ABC | Ed | +,e,c | SELF | $15.00 | 0 | 2 |
| III CHEERS (4 ISSUES) | DISK MAG. | III | SCHEER | $40.00 | * | * |
| III CHEERS (QUARTERLY ISSUE) | * | III | * | $12.50 | 0 | 1 |
| III EASY PIECES | WpSsDb | III | SEZPIE | $250.00 | 2 | 0 |
| CALENDAR PAK III | Apl | III | SCALPK | $79.00 | 1 | 0 |
| COSMIC COMBAT | ArcGa | +,e | SCCO | $12.50 | 0 | 2 |
| DISKPAK 7 | Ga | +,e | SD7 | $17.50 | 0 | 2 |
| MICROBE | ArcAdvGa | +,e | SMIC | $30.00 | 1 | 0 |
| MUMMY'S CURSE | AdvGa | +,e | SMCU | $12.50 | 0 | 2 |
| TRANSYLVANIA | AdvGa | Mac | STRA | $25.50 | 0 | 4 |
| HIGHER TEXT PLUS/IIe UPDATE | * | * | FUPD | $5.00 | 0 | 2 |
| APTEST/IIe UPDATE | * | * | FUPD | $5.00 | 0 | 2 |
| APPLESOFT CARPENTER-II UPGRADE | * | * | SCARUP | $10.00 | 0 | 4 |
| MULTI-TRIEVE 1.4/UPGRADE | * | * | SMULUP | $10.00 | 0 | 5 |
| SPREADSHEET/UPDATE | * | * | * | $10.00 | * | * |
| CATERKILLER | ArcGa | +,e | SCATKI | $12.50 | 0 | 2 |
| WICKERWARE #1 | Ga | +,c,e | SWICWA | $12.50 | 0 | 2 |
| BOLO | ArcGa | +,c,e | SBOLO | $15.00 | 0 | 8 |
| U-BOAT COMMAND | ArcGa | +,c,e | SUBCOM | $12.50 | 0 | 8 |
| CRITICAL MASS | AdvGa | +,c,e | SCRIMS | $15.00 | 0 | 3 |
| MINOTAUR | ArcGa | +,c,e | SMINOT | $15.00 | 0 | 2 |
| BUZZARD BAIT | ArcGa | +,c,e | SBUZBT | $15.00 | 0 | 3 |
| FREE FALL | ArcGa | +,c,e | SFREFL | $15.00 | 0 | 2 |
| JELLYFISH | ArcGa | +,c,e | SJELLY | $15.00 | 0 | 2 |
| PENSATE | Ga | Mac | SPENST | $28.00 | 0 | 3 |
| PLASMANIA | ArcGa | +,c,e | SPLASM | $15.00 | 0 | 3 |
| REPTON | ArcGa | +,c,e | SREPTN | $15.00 | 0 | 3 |
| SNAKE BYTE | ArcGa | +,c,e | SSNABT | $15.00 | 0 | 2 |
| TWERPS | ArcGa | +,c,e | STWERP | $15.00 | 0 | 2 |
| XYPHUS | AdvGa | Mac | SXYPHS | $28.00 | 0 | 4 |
| FLY WARS | arcGa | +,c,e | SFLYWS | $15.00 | 0 | 4 |
| EAMON SERIES | AdvGa | +,c,e | SEAMON | $5.00 | 0 | 2 |
| PUBLIC DOMAIN SOFTWARE | * | * | * | $5.00 | 0 | 2 |
| PUBLIC DOMAIN SOFTWARE CATALOG | * | * | FPDS | $1.00 | 0 | 2 |
| ANTHOLOGY DISKETTES | * | * | * | $12.50 | 0 | 2 |
| ALL ABOUT APPLESOFT-DISKETTES | UtProgs. | +,c,e | SIN1 | $16.50 | 0 | 2 |
| ALL ABOUT PASCAL DISKETTES | UtProgs. | +,c,e,III | SIN2 | $20.00 | 0 | 3 |
| ALL ABOUT DOS DISKETTES | UtProgs. | +,c,e | SIN3 | $15.00 | 0 | 2 |
| MAC PUBLIC DOMAIN SOFTWARE | * | Mac | SMCPDS | $7.00 | 0 | 2 |
| TITLE MASTER | GrUt | Mac | STITMA | $20.00 | 0 | 8 |

LEGEND:

| | | | | |
|---|---|---|---|---|
| Ds=DOS | Ut=UTILITY | Pd=PRODOS | Ap=APPLESOFT | Ml=MACHINE LANGUAGE |
| Gr=GRAPHICS | Ed=EDUCATIONAL | Diag.=DIAGNOSTIC | Apl=APPLICATION | Fin=FINANCIAL |
| Db=DATA BASE | Ss=SPREADSHEET | Arc=ARCADE | Wp=WORD PROCESSOR | |
| Ga=GAME | Adv=ADVENTURE | Progs.=PROGRAMS | DrCtrl=DRIVE CONTROLLER | |
| Spec.=SPECIAL | 1/cDispl.=LOWER-CASE DISPLAY | | SSD=SOLID STATE DISK | |

HARDWARE AND ACCESSORIES

| PRODUCT NAME | INDEX CODE. | USE ON | PROD. CODE | PRICE | LBS. | OZ. |
|---|---|---|---|---|---|---|
| AP CONTROLLER | DrCtrl | +,e | HAPC | $85.00 | 0 | 4 |
| AP COOL KIT | Fan | + | HAKK | $25.00 | 2 | 0 |
| AP DRIVE | DiskDr | +,e | HAPD | $205.00 | 6 | 0 |
| AP.LCASE 1 | 1/cDispl. | + | HLC1 | $30.00 | 0 | 2 |
| AP.LCASE 1 w/DICE | 1/cDispl. | + | HLC1A | $37.50 | 0 | 3 |
| AP.LCASE 2 | 1/cDispl. | + | HLC2 | $25.00 | 0 | 2 |
| AP.LCASE2 w/DICE | 1/cDispl. | + | HLC2B | $30.00 | 0 | 2 |
| APPLESURANCE | * | +,e | HAUD | $85.00 | 1 | 0 |
| APPLE IIe 80-COLUMN BOARD | * | e | H80C | $120.00 | 0 | 8 |
| APPLE III DISK DRIVE | * | III | HDR3 | $285.00 | 6 | 0 |
| ASF 3.5" MICRO-FLOPPY (BOX 5) | * | Mac/Lisa | HBASF | $22.50 | 0 | 7 |
| DISK BANKS | * | (5.5") | HDBA | $4.50 | 1 | 0 |
| 10 - GENERIC DISKETTES | * | +,c,e,III | HGEN10 | $19.00 | 0 | 8 |
| 100 - GENERIC DISKETTES | * | +,c,e,III | HGEN10 | $150.00 | 5 | 0 |
| DISKETTES-VERBATIM (10/BOX) | * | +,c,e,III | HVEB | $25.00 | 1 | 0 |
| DRIVE ADAPTOR IIc | * | c | H2CCBL | $15.00 | 0 | 3 |
| FLASHCARD 288K | SSD | +,e | HSSD | $525.00 | 2 | 0 |
| FLASHCARD 144K | SSD | +,e | HSSS | $345.00 | 2 | 0 |
| FLASHCARD 144K UPGRADE KIT | SSD | +,e | HSSU | $200.00 | 0 | 2 |
| FLIP SORT DISK ORGANIZER | * | * | HFLS | $22.50 | 3 | 0 |
| HOME CONTROLLER | Spec.Apl | +,e | HHOC | $40.00 | 0 | 8 |
| A.P.P.L.E. HARD DISK (10-MEGABYTE) | * | +,e | HHARDR | $1095.00 | 26 | 0 |
| KOALA TOUCH TABLET | Gr | +e | HPAD | $95.00 | 2 | 0 |
| KOALA TOUCH TABLET | Gr | c | HKOA2C | $95.00 | 2 | 0 |
| MAC COVERS | * | Mac | HMCCVR | $25.00 | 2 | 0 |
| MACH III JOYSTICK | * | +,e | HJMACH | $44.00 | 1 | 0 |
| MACH III JOYSTICK | * | e,c | HJOMA3 | $49.00 | 1 | 0 |
| MACH II JOYSTICK | * | + | HJOYST | $34.00 | 1 | 0 |
| MACPAK | ToteBag | Mac | HMACPK | $64.95 | 6 | 0 |
| MEDIA MATE 3 | Access. | (3.5") | HDSMT3 | $12.99 | 2 | 0 |
| MEMOREX MICRO-FLOPPY (BOX 10) | * | (3.5") | HDMEMO | $44.00 | 0 | 10 |
| MOCKINGBOARD | Voice | +,e | HMOBII | $165.00 | 2 | 0 |
| MOCKINGBOARD | Voice | c | HMOB2C | $165.00 | 3 | 0 |
| MULTIMODEM IIe | 300 BAUD | +,e | HMOD2E | $199.00 | 3 | 0 |
| MULTIMODEM HC3 | 300 BAUD | +,c,e | HMODC | $225.00 | 4 | 0 |
| MULTITECH MODEM | 1200 BAUD | +,c,e | HMODHC | $425.00 | 5 | 0 |
| MULTITECH MODEM | 1200 BAUD | IBM PC | HMODPC | $399.00 | 5 | 0 |
| PADDLE-ADAPPLE | Adaptor | +,e | HPADDL | $25.00 | 0 | 5 |
| PANASONIC KX-1091 PRINTER | * | +,c,e | HPANPT | $369.00 | 20 | 0 |
| PANASONIC PRINTER RIBBONS | * | * | HPANRI | $14.00 | 0 | 5 |
| PANASONIC RS232-SERIAL OPTION | * | * | HSERIN | $85.00 | 1 | 0 |
| POWER SUPPLY | * | +,e | HPOWSU | $85.00 | 3 | 0 |
| PRINTER RIBBONS - PROW/NEC/AP/DMP/ | * | * | HPRC | $4.95 | 0 | 3 |
| PRINTER RIBBON - TALLY MT160L | * | * | HTRC | $12.50 | 0 | 7 |
| PRINTER RIBBON - TALLY MT 180L | * | * | HTRI | $17.00 | 1 | 0 |
| PROMODEM 1200 | * | +,e | HPRMOD | $399.00 | 6 | 0 |
| PROMODEM 1200 IIc | * | c | HPRO2C | $399.00 | 7 | 0 |
| PROMODEM 1200A | * | II,+,e | HMODA | $349.00 | 5 | 0 |
| PROMODEM 1200M | * | Mac | HMODM | | 7 | 0 |
| PIXY PLOTTER 3 PARALLEL INTERFACE | * | +,e,c | HTPAP | $299.00 | 18 | 0 |
| PIXY PLOTTER 3 PARALLEL INTERFACE | * | IBM | HTPIP | $299.00 | 18 | 0 |
| PIXY PLOTTER 3 SERIAL INTERFACE | * | +,c,e | HTPAS | $299.00 | 18 | 0 |
| PIXY 3 ACCESSORIES- | | | | | | |
| WATER-BASE PEN SET | | | | | | |
| 5-BLACK | * | PIXY3 | HPLBLK | $10.00 | 1 | 0 |
| 5-BLUE | * | PIXY3 | HPLBLU | $10.00 | 1 | 0 |
| 5-RED | * | PIXY3 | HPLRED | $10.00 | 1 | 0 |
| 5-GREEN | * | PIXY3 | HPLGRE | $10.00 | 1 | 0 |
| 1 EA. GREEN,VIOLET,BROWN ORANGE,PINK | * | PIXY3 | HPLPEN | $10.00 | 1 | 0 |
| OIL-BASE PEN SET | | | | | | |
| 5-BLACK | * | PIXY3 | HPNBLK | $12.50 | 1 | 0 |
| 5-BLUE | * | PIXY3 | HPNBLU | $12.50 | 1 | 0 |
| 5-RED | * | PIXY3 | HPNRED | $12.50 | 1 | 0 |
| 5-GREEN | * | PIXY3 | HPNGRE | $12.50 | 1 | 0 |
| 1 EA. GREEN,VIOLET,BROWN ORANGE,PINK | * | PIXY3 | HPLPTR | $12.50 | 1 | 0 |
| PLOTTER PAPER (100 SHEETS- GLOSSY) | * | PIXY3 | HPLGPA | $8.50 | 2 | 0 |
| OVERHEAD TRANSPARENCY PACK (50 SHEETS) | * | PIXY3 | HPLTRA | $30.00 | 1 | 0 |
| PRINTPAK | ToteBag | Mac | HPRPAK | | 3 | 0 |
| HOBBY PROTOTYPING BOARD 11" | * | +,e | HP11 | $21.00 | 0 | 5 |
| PROMETHEUS 16K RAM CARD | * | + | HP16 | $55.00 | 0 | 8 |
| PROMETHEUS 128K RAM CARD | * | +,e | HP28 | $295.00 | 1 | 0 |
| RIGHT NOTCH | Punch | * | HRIGNO | $15.00 | 0 | 2 |
| REPEATERRR | Keyboard | + | HRPT | $25.00 | 0 | 5 |
| SOFTCASE | ToteBag | +,c,e | HSOFTC | $39.00 | 3 | 0 |
| SUPER FAN II | * | +,e | HFAN | $79.00 | 3 | 0 |
| TYPING AID | Stand | * | HPAG | $13.00 | 2 | 0 |
| MULTIVIEW 80/160 | 80-Col. | +,e | HMULTI | $249.00 | 2 | 0 |
| ULTRA-ROM BOARD/EDITOR/APB-102 | UtProgs. | +,e | HURB | $149.00 | 2 | 0 |
| ULTRA-ROM ADD-ON/APU-2 | UtProgs. | +,e | HRENUM | $29.00 | 0 | 3 |
| ULTRA-ROM ADD-ON/DISK COPY/EDIT | UtProgs. | +,e | HDSCPY | $32.00 | 0 | 3 |
| VIEWMASTER 80-COLUMN CARD | * | +,e | HVIE80 | $149.00 | 2 | 0 |
| VERSACARD (NO CABLE) | * | +,e | HVRC | $150.00 | 2 | 0 |
| W/6' PARALLEL CABLE | * | * | HVRC1 | $160.00 | 2 | 0 |
| W/6' FEMALE SERIAL CABLE | * | * | HVRC2F | $160.00 | 2 | 0 |
| W/6'MALE SERIAL CABLE | * | * | HVRC2M | $160.00 | 2 | 0 |
| W/1' FEMALE SERIAL CABLE | * | * | HVRC3F | $160.00 | 2 | 0 |
| W/1' SERIAL CABLE | * | * | HVRC3M | $160.00 | 2 | 0 |
| 6' PARALLEL CABLE | * | * | HVPC | $20.00 | 0 | 4 |
| 6' FEMALE SERIAL CABLE | * | * | HVSLF | $20.00 | 0 | 4 |
| 6' MALE SERIAL CABLE | * | * | HVSLM | $20.00 | 0 | 4 |
| 1' FEMALE SERIAL CABLE | * | * | HVSSF | $20.00 | 0 | 2 |
| 1' MALE SERIAL CABLE | * | * | HVSSM | $20.00 | 0 | 2 |
| VERSACARD ROM APPLE DMP | * | * | HVPRAP | $30.00 | 0 | 3 |
| VERSACARD ROM PROW/NEC/C.ITOH | * | * | HVPRCI | $30.00 | 0 | 3 |
| VERSACRAD ROM EPSON PANASONIC | * | * | HVPREP | $30.00 | 0 | 3 |
| VERSACARD ROM IDS | * | * | HVPRID | $30.00 | 0 | 3 |
| VERSACARD ROM OKIDATA | * | * | HVPROK | $30.00 | 0 | 3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| VIDEX UNIPRINT PARALLEL -PRINTER INTERFACE | * | * | HVIDIN | $74.00 | 1 | 6 |
| ZARDAX KEYBOARD CONNECTOR | * | + | HZARKY | $7.00 | 0 | 5 |
| A.P.P.L.E. T-SHIRT | * | * | * | $5.00 | 0 | 5 |

**PUBLICATIONS**

| PRODUCT NAME | INDEX CODE. | USE ON | PROD. CODE | PRICE | LBS. | OZ. | PG.# |
|---|---|---|---|---|---|---|---|
| BACK ISSUES CALL-A.P.P.L.E. | * | * | * | * | 0 | 8 | |
| APPLE II CIRCUIT-DESCRIPTION | * | * | PACD | $18.50 | 3 | 0 | |
| BENEATH APPLE DOS | * | * | PBAD | $17.00 | 1 | 0 | |
| GOING PLACES WITH- THE APPLE IIc | * | * | PAPP2C | $3.25 | 0 | 7 | |
| THE APPLE ALMANAC | * | * | PAPALM | $17.50 | 2 | 0 | |
| THE APPLE CONNECTION | * | * | PAPCON | $12.95 | 2 | 0 | |
| THE APPLE II BASIC HANDBOOK | * | * | PAPHDB | $12.95 | 1 | 0 | |
| THE ELEMENTARY APPLE | * | * | PELA | $11.00 | 1 | 0 | |
| SOFTWARE AUTHORS GUIDE | * | * | PAUTGU | $17.50 | 2 | 0 | |
| IN DEPTH VOL #1 ALL ABOUT APPLESOFT | * | * | PID1 | $7.00 | 1 | 0 | |
| IN DEPTH VOL #2 ALL ABOUT PASCAL | * | * | PID2 | $11.00 | 2 | 0 | |
| IN DEPTH VOL #3ALL ABOUT DOS | * | * | PID3 | $13.50 | 2 | 0 | |
| IN DEPTH VOL #4 ALL ABOUT MICROWRITER IIe | * | * | PID4 | $12.50 | 1 | 0 | |
| IMAGINATOR SOURCE LISTING | * | * | PIMAGS | $30.00 | 1 | 0 | |
| VOL II 1979 COMPENDIUM | * | * | PPK2 | $10.00 | 1 | 0 | |
| VOL III 1980 COMPENDIUM | * | * | PPK3 | $15.00 | 2 | 0 | |
| BOUND SET CALL-A.P.P.L.E. 1982 | * | * | PPK5 | $18.50 | 6 | 0 | |
| BOUND SET CALL-A.P.P.L.E. 1983 | * | * | PPK6 | $18.50 | 6 | 0 | |
| USING 6502 ASSEMBLY LANGUAGE | * | * | PU65 | $17.00 | 1 | 0 | |
| WOZ TALKS (VHS VIDEO TAPE) | * | * | PWTA | $27.50 | 1 | 0 | |
| WHAT'S WHERE IN THE APPLE | * | * | PWWA | $17.00 | 2 | 0 | |
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| 11 " | 12.50 | 16.33 |
| 12 " | 13.50 | 17.51 |
| 13 " | 14.50 | 18.69 |
| 14 " | 15.50 | 19.87 |
| 15 " | 16.50 | 21.05 |
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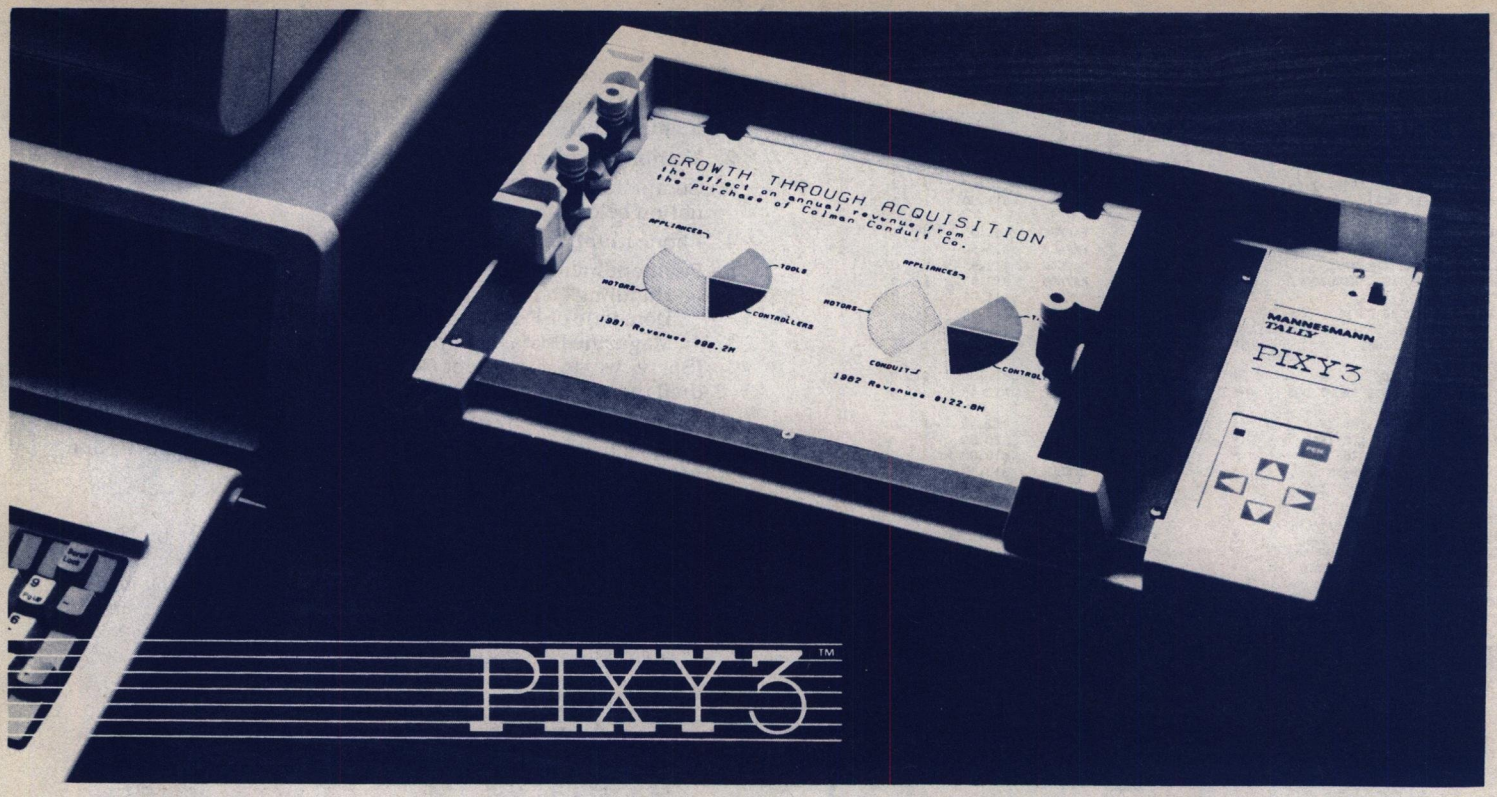


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**CHARACTER SET**

**Basic:**
96 characters ANSI or other
(specified by font command)
**Extended:**
☐ 37 Greek characters
☐ 9 international character sets

**PENS**

**Type:**
Fiber tip—water base for paper, oil base for transparency film
**Colors:**
black, red, blue, green, brown, orange, rose, purple

**CONTROLS**

**Power:**
On/off
**Directions:**
Left, right, up, down
**Pen:**
Up/down

**INDICATORS**
☐ Power On
☐ Error

**OPERATING MODES**
☐ Plotter
☐ Printer
☐ Diagnostic

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**Width:** 43.0 cm (16.9 in)
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**POWER REQUIREMENTS**
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**Consumption:** 40 VA maximum

**ENVIRONMENTAL REQUIREMENTS**
**Temperature:**
5 to 35°C (41 to 95°F)
**Relative Humidity:** 35 to 75%

**INTERFACES**
☐ 8-bit parallel or
☐ RS-232 C

**STANDARD ACCESSORIES**
☐ Fuse 0.5A 120 VAC
☐ Fuse 0.3A 220V; 240 VAC
☐ 2 Paper clamps
☐ Operator's manual
☐ Black, red and blue pens

**OPTIONAL EQUIPMENT**
**Pens:** Eight colors
**Paper:** 100 sheets
**Mylar Film:** 50 sheets

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**There are three ways to learn 6502 Assembly Language on your Apple Computer:**

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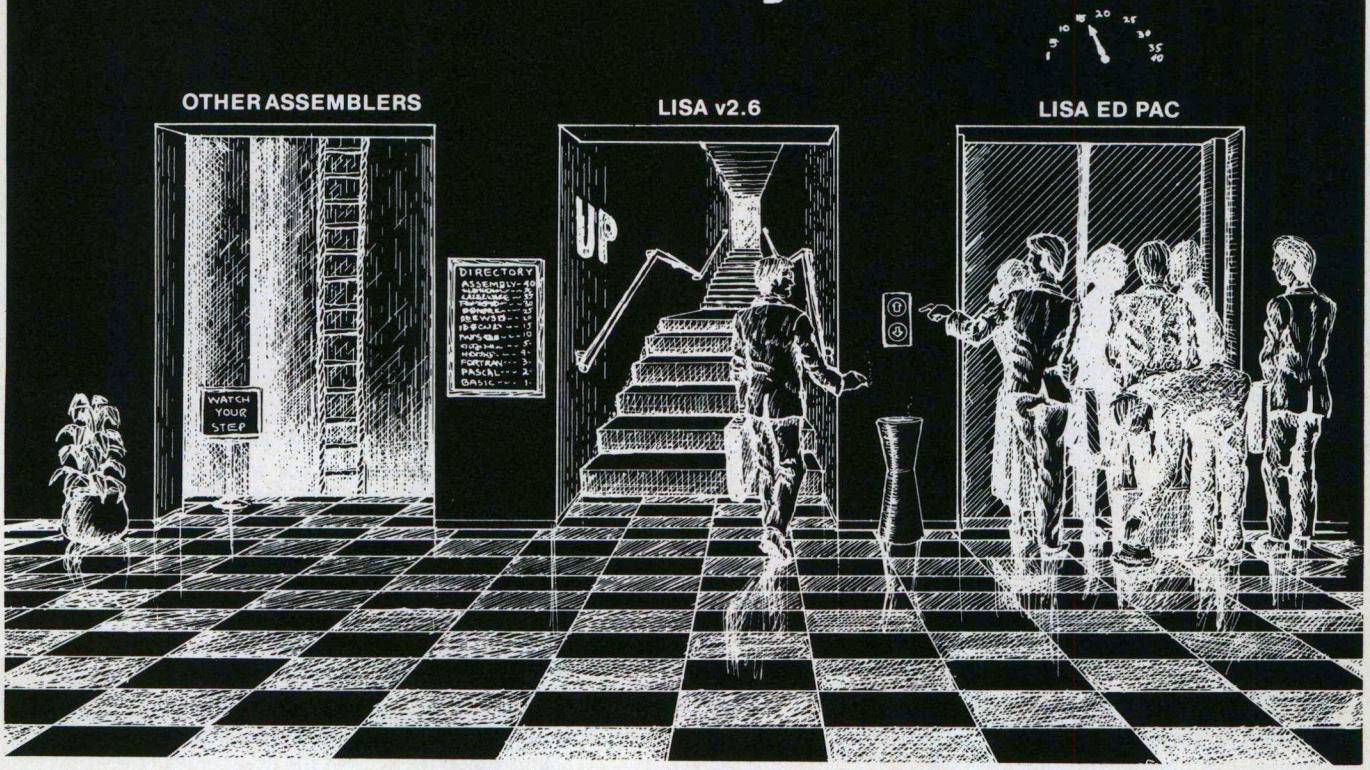


## Introducing the Easiest Way: The LISA Ed Pac™

You can't deny that learning assembly is extremely important for you if you want to make the most of your work. If assembly language wasn't so important, why are almost all of the top selling programs available for the Apple II written in assembly language? But let's face it, learning 6502 assembly language isn't a piece of cake. At least not until now. Because now there's the LISA Education Package™ from Lazerware. It'll have you up to speed with assembly language in a fraction of the time it would otherwise take.

The LISA Ed Pac™ begins with LISA v2.6, the favorite assembler of beginners and professionals alike. More Apple owners have learned 6502 assembly language using LISA than all the other assemblers combined. More tutorial material is available for LISA, including books by D. Fudge, R. Hyde, W. Maurer, and R. Mottola. Randy Hyde's 300-page *Using 6502 Assembly Language* is included in the LISA Ed Pac™.

Next we threw in SPEED/ASM™, a set of 6502 subroutines that make programing in assembly language as easy as BASIC. And for those who want to see how it's done, the SPEED/ASM source listings are also included. We also included the LUD # 1 (Lisa Utility Disk # 1) which includes an extended editor for LISA and a LISA source file listing utility. Finally, we added MAXWELL'S Debugger™ to the LISA Ed Pac. This ultra-powerful debugger/monitor makes learning and debugging 6502 assembly language a breeze.

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# LAZERWARE

For a copy of Lazwerware's *A Guide to Purchasing a 6502 Assembler for Your Apple II or Apple //e*, write us at Lazerware, 925 Lorna St., Corona, CA 91720 or call us at (714) 735-1041
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Circle 36 on Reader Service Card

# Something Over 32 Bits

**Questions & Answers About Apple's Lisa and Macintosh 32-bit Computers**

**Dave Redhed**

***I have been PEEKing around in Microsoft BASIC and have found a number of interesting locations that permit me to do some extra things with BASIC. For example, PEEK(106723) + PEEK (106722)*256 is the same as PEEK(124) + PEEK(123)*256 in Applesoft. This is the current line number from which DATA is being read. For the 512K Mac the numbers are 499939 and 499938. Are others interested in this kind of information?***

Surely everyone with a Mac who bought *All About Applesoft* would be interested. This tidbit of pointers comes from Dennis Dent, one of our Canadian members, who has become frustrated with trying to get this kind of information out of Microsoft. I have put this on the A.P.P.L.E. Crate Bulletin Board to see if anyone else is doing this kind of thing.

***Could you tell me what the connector pinouts are for the Mac serial connector?***

Sure, nothing to it! After digging around *Inside Macintosh* for a while and guessing that this could be filed under "Macintosh, Misc," it popped right off the page to me. There is a one-page memo with the following information (all the following is taken straight from the memo):

1 - GND
2 - +5 (May turn into an output handshake line - don't use!)
3 - GND
4 - TXD+
5 - TXD-
6 - +12 (For detecting power on ONLY!)
7 - HSK (CTS or TRxC, depending on 8530 mode)
8 - RXD+
9 - RXD-

For more-or-less RS232, use GND, TXD-, RXD-. The TXD+ and RXD+ signals provide RS422/423 compatibility. The HSK (handshake) line (an input) connects to both CTS and to TRxC on the 8530. It can be used either for CTS or for external clock, depending on the mode the 8530 is in. As RS232 handshake, it usually connects to pin 20 on a DB-25.

***You stated in a previous issue that the Dot Matrix Printer used with the Lisa 1 could not be used when running MacWorks on Lisa. I talked to the Apple Hotline and they said there was a driver that could be installed to switch MacWorks output to the DMP. They offered to give it to me if I would send a diskette and also said that dealers should have it. The one drawback is that you can have one printer or the other, but not both at the same time.***

Thank you for your discovery. For all those Lisa 1 owners who haven't already bought an ImageWriter your information is a real money saver. The one local dealer which I tried did not know anything about it yet, but said that they would inquire for me. When I talked to the local Apple Computer office, they had not yet received a copy of the driver.

***I have heard about this really classy debugger for Mac that requires two Macs to run. Aren't there any debuggers for us po' folks with just one Mac?***

Would you believe that there are a total of seven other debuggers? All those listed below are currently being distributed as part of the Workshop Supplement:

(1) MacsBug, and on-screen debugger with 8 lines of swapping display and the disassembler.

(2) SmallBug, the same as MacsBug but without the disassembler.
(3) TinyBug, the tiniest version of MacsBug which doesn't swap the display (Yes indeed, it really does trash the screen).
(4) MidiBug, a 16 line version of MacsBug (still works on a 128K machine).
(5) MaxBug, a full screen version of MacsBug (requires a big machine).
(6) TermBug, a terminal based debugger with disassembler (our old friend).
(7) Termite, a terminal based debugger only.

These are described in a four page manual called "The Last Whole Debugging Catalog." As a special note to Lisa owners, I do not think that they ever planned on someone running these under MacWorks. When I try, the screen is total garbage.

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# SCRG PRODUCTS FOR THE APPLE COMPUTER

## SWITCH-A-SLOT

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The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards at one time. One of these cards is selected for use, and only that card draws power.

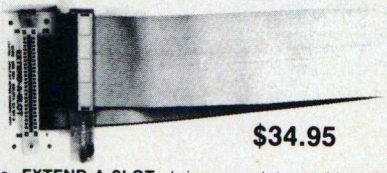
This product is especially useful where the software requires the printer to be in a particular slot, and the user wishes to choose between two or more printers.

- Allows up to four peripheral cards to be plugged into one peripheral slot.
- User selects desired card by front panel rotary switch.
- Only selected card draws power.
- Plugs into any peripheral slot.
- Saves wear and tear on delicate connectors.
- 18" cable connects Switch-a-slot to computer.

**New—resistive terminations for better response**

**SWITCH-A-SLOT and EXTEND-A-SLOT work well with all slow to medium speed cards, such as Modems, Printers, Clock, 80 Column, Music, etc. They are not recommended for high speed data transfer devices such as disk drive controllers, alternate processor, and memory cards. These products may be incompatible with some alternate processor cards.**

## EXTEND-A-SLOT



**$34.95**

The **EXTEND-A-SLOT** brings a slot outside your APPLE™, allowing an easy change of cards. The 18" flex cable is long enough to allow placement of the card in a convenient location. The high quality connectors are gold plated for reliability.

The perfect accessory for:

Owners of large numbers of I/O expansion cards—keep your frequently used cards installed. Use the EXTEND-A-SLOT for the others.

Technicians—easy access to test points on accessory cards under actual operating conditions.

Experimenters—make easy changes to cards while card is installed.

EASY TO USE—just plug it in as you would any expansion card, then plug your card in. When you want to change cards, do it easily outside the computer, without the wear and tear on the computer expansion slot.

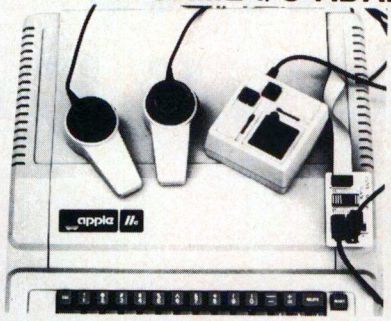
## OTHER PRODUCTS

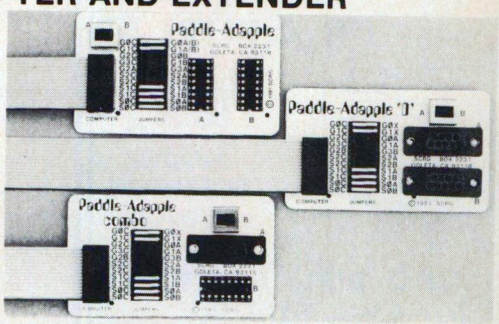
D Manual controller. Gives complete control over the $C000 through $C0FF range in hardware. Can be switched while program is running. $89.50.

MAGIC KEYBOARD (for ][ or ][+ only). Re-encodes the keyboard to give alternate keyboards, such as DVORAK, ASK, 10-KEY, HEXIDECIMAL KEYPAD, etc. $49.50.

## Paddle-Adapple

### GAME I/O ADAPTER AND EXTENDER




- Works with all Apple compatible joysticks, paddles and other I/O devices.
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- Use 4 paddles simultaneously.
- Unique "Jumpers" socket allows you to configure to meet your needs.
- BPI™ users can have BPI™ device and paddles plugged in simultaneously. (**Paddle-Adapple** and **Paddle-Adapple Combo** only).
- Gives you four push-button inputs.
- Supports shift key modification.
- Exchange X & Y joystick axis.
- Small and compact — adheres to computer with supplied foam tape.
- All Strobes, annunciators and power available on all 16 pin connectors.
- Supplied with 18" cable.

**$29.95**

The **Paddle-Adapple** has two 16 pin sockets

The **Paddle-Adapple "D"** works with the subminiature D connectors.

The **Paddle-Adapple Combo** has one 16 pin socket and one subminiature D connector.

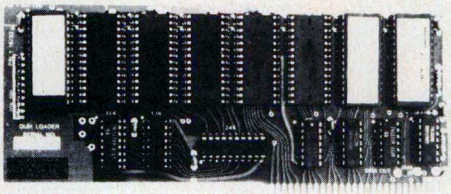
## NEW 9-16 Adapter

**For Apple / /e and / /c**

This product permits the use of most 16-pin I/O devices with the APPLE //c or //e. By plugging this adapter into the sub-miniature 'D' connector, you can plug in a 16-pin device, such as the Paddle-Adapple, paddles, joystick, KOALA PAD™, etc. The only limitations are those devices that use the annunciators or the C040 strobe, such as the POWER PAD™. Please note that the //c does not support four joystick inputs.

**$14.95**

## quikLoader™



We start your library of programs with the most popular utilities on the card, FID and COPYA. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

We are currently licensed to sell several very popular programs on EPROM. **DOUBLE—TAKE** by BEAGLE BROS., and **COPY ][ PLUS** by CENTRAL POINT SOFTWARE. The introductory price for DOUBLE—TAKE is $45.00. This includes the program exactly the same as you would buy it at your dealer for $34.95 (including disk and documentation), and a programmed 27128 EPROM (worth about $25.00). COPY ][ PLUS cost $65.00. This includes the original program (worth $39.95) and **two** programmed 27128's.

Other programs available directly from us or the publishers are, **BARKOVITCH I/O TRACER AND SINGLE STEP TRACE, MICRO/TYPOGRAPHER** from **TIDBIT SOFTWARE, ECHO** speech synthesizer software from **STREET ELECTRONICS,** and **MERLIN** assembler, from **ROGER WAGNER PUBLISHING.** More commercial programs are now in the works.

**FAST AND CONVENIENT**

The quikLoader is the *fastest* way to load programs. **BAR NONE!** Programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. Frequently used programs are available *instantly* when you need them, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly.

To run a program from the quikLoader, bring up the quikLoader catalog (Q-reset), and the names of the programs will be displayed, along with an index letter. Pressing the index letter will instantly load and run the program.

Up to 23 programs on the quikLoader can be displayed on the screen at one time. If you have more programs, you may scroll through the catalog in either direction.

The quikLoader is **ideal** for applications requiring a dedicated computer. Your program can be automatically loaded and run at "power-up".

**PROGRAMMING EPROMS**

Putting your own programs on the quikLoader is easily done, using a separate EPROM programmer such as the **PROmGRAMER.** For APPLESOFT, INTEGER, or single machine language files, no programming knowledge is necessary. You **will** need experience if you want to save copy-protected or complex programs. The amount of experience necessary depends on the complexity of the program.

**COMMERCIAL PROGRAMS**

If you have a program that is valuable, it will become **more** valuable when it is instantly available to you. We are actively seeking licenses from software publishers to allow their popular programs to be made available for the quikLoader. Independent authors are encouraged to write programs suitable for the quikLoader. If the author wishes, we will market the program (with appropiate royalties), or the author can take care of all marketing. In either case, we will make known to our customers the availability of these programs.

**MEMORY CAPACITY**

The quikLoader has eight sockets for EPROMs. These sockets can accommodate standard EPROMs from 2716 to 27512. These types can be freely intermixed. The memory capacity of the quikLoader depends on the EPROMS used. For example, the 2716 can hold 2K of programs, and the 27512 can hold 64K. (Frankly, the current costs of the 27512 is prohibitive,but should come down drastically in the next year.) At this writing, the least cost-per-bit is provided by the 2764, which can hold an 8K program. Using these "chips", the quikLoader becomes a 64K ROM. Using larger capacity EPROMs allows it to become a 128K, 256K, or even a 512K card. If more memory capacity is needed, the quikLoader operating system supports multiple quikLoaders.

**INCREASED DISK CAPACITY**

Since DOS is loaded from the quikLoader every time the computer is turned on, it is not necessary to take up valuable disk space with DOS. This will give you more than 5% additional space for programs and data on your disks.

**ABOUT THE DESIGNER**

The quikLoader was designed by Jim Sather, author of UNDERSTANDING THE APPLE ][ (forward by Steve Wozniak), published by QUALITY SOFTWARE (21601 Marilla Street, Chatsworth, CA 91311 (818) 709-1721).

**SYSTEM REQUIREMENTS**

The quikLoader plugs into any slot of the APPLE ][+ or //e. If used in a ][+, a slightly modified 16K memory card is required in slot 0. A disk drive is required to save data.

DOS, INTEGER BASIC, FID, and COPYA are copyrighted programs of APPLE COMPUTER, INC. licensed to Southern California Research Group to distribute for use only in combination with quikLoader.

**$179.50**

## PROmGRAMER™

The **PROmGRAMER** will read or program any of the standard single-volt EPROMS from the 2708 to the 27512. Features include:

- Slot independent operation for the APPLE // family of computers.
- Zero insertion force sockets accepts 24 or 28 pin devices.
- Disk based software allows easy customization of software.
- Complete instructions for loading software into quikLoader.

**$149.50**

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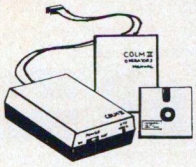

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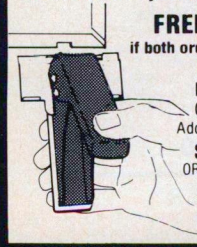

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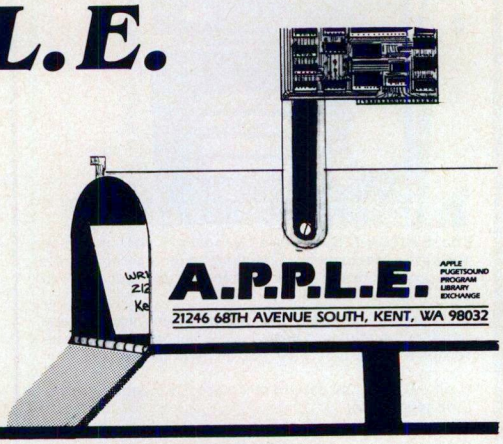



## More Help For Rodney

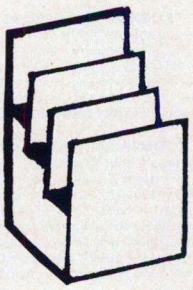
Dear Sheryl Blix,

In the September, 1984 edition of *Call -A.P.P.L.E.*, I read the article on your work with Rodney almost with tears in my eyes, except that Rodney is so "with-it" that I couldn't quite pity him. My ability to type this (and all the other things I do for school) is taken for granted until I see something like your article!

Re: your request for ideas on how to load the disk drive—

From the illustration which came with the article, I assume that the wand has a soft pad on the keyboard end, that to remove the disk Rodney urges it out with the pad and eventually the disk falls on the desk. Although I am not an inventor, I was wondering if you could do the following:

Use a disk rack, like the one shown here, which stacks the disks in slots with each one higher than the one in front. The edge of the disk is thus exposed and easier to grip.



Could a wand be devised which has a slot in the end deep enough to grasp a disk and carry it if held horizontally? If so, then by placing the rack at an almost-horizontal angle (rather than vertical) and placing the disk drive at a height for convenient insertion of the disk, rather than at the usual desk height, perhaps Rodney could move the disk from the rack to the drive, push it in, and close the door. I assume from your text that he can open the door with the wand.

The other (unlikely!) option is to convince someone to donate a 10-meg ProFile hard disk with Catalyst! That ought to provide enough disk space without the need for physically moving the diskettes.

I hope these suggestions, or some from another *Call -A.P.P.L.E.* reader, will enable Rodney to have even greater control over his environment. Good luck to all of you.

Sincerely,
*Joyce Conklin*

Hi Rodney,

I read about you in Sheryl Blix's article in *Call -A.P.P.L.E.* (Sept., 1984). It made me very happy to read about you—you make me proud to belong to the human race. You are proving to the world that you can be an intelligent human being, even if you can't use your arms and legs—and that tells us all something very important. It says that "human-ness" is something in the mind, and the heart, and the spirit.

Some people define "human being" as "an animal with two arms and two legs", but you have shown that a human being is something much more important than that. Bravo, Rodney!

I thought of something that might help you. Sheryl said, in the article,

that you had trouble handling disks. You might be able to find the tool you need in a photography shop.

When a photographer develops his own pictures, he uses a special kind of tongs (like a pair of tweezers, but much bigger( called "print tongs," to handle the wet pictures. These tongs are about six or eight inches long, made out of wood or plastic. Some kinds have soft rubber tips, which help them grip things more firmly.

If you could find a pair of print tongs that were the right size and shape, you could probably hold them in your mouth and control them with your teeth. Then you could hold the disk in the tongs, and (maybe) put it into the drive without help.

Good luck!

Sincerely,

*Jock Root*

## RENUMBER Readjustment

Another bug in the Apple RENUMBER program has surfaced, and I thought it might be of interest to other A.P.P.L.E. members. A previous letter presented a fix for a bug which caused numbers following the "*" token to be altered (*Call -A.P.P.L.E.*, October, 1981, page 76). As was the case previously, the present bug is also in the relocation routine which installs RENUMBER below HIMEM and resets HIMEM below RENUMBER. In the older version of RENUMBER supplied on the DOS 3.3 Master disk for the Apple II and II+, if HIMEM had been changed from its normal value of 38400, the relocation routine did not work properly. In the version provided later on the DOS 3.3 Master disk for the Apple *//e*, the program issued a "MAXFILES 3" before doing the relocation, so the problem was recognized to that extent. With this change the program usually works all right, but if a program has been installed above the buffers (e.g. PLE) the "MAXFILES 3" command does not set HIMEM to 38400 and the relocation routine does not work properly.

The reason for the problem is the method used to determine whether an address in the program requires correction in the relocation process. If you load RENUMBER, go to the monitor, and enter B60L, you should see somewhere a section of code which disassembles as:

```
18       CLC
69 10    ADC -$10
10 09    BPL $0B89
18       CLC
69 70    ADC -$70
```

This section of code appears at $B7B in the *//e* version, and at $B62 for the II+ version. What this code does is add $10 to the third byte of a three byte instruction and determine whether it is positive. If so it was either above $EF or below $70, so that addresses in the monitor would not be changed, nor would the ASCII codes for the screen messages. That's fine, but later on in the code there is a jump to an Applesoft subroutine whose address *does* (intentionally) get changed. If you enter 1080L, you should find a line "**4C 6C C8 JMP $C86C**." This is found at $109C for the *//e* version and at $1083 for the II+ version. With HIMEM at 38400 this gets changed to a jump to $D66C, but if HIMEM is something else it comes out differently.

At first glance, it appears that the easiest fix is to change the ADC #$10 and the ADC #$70 both to ADC #$40 and change the jump address from $C86C to $D66C. If it is this easy, why didn't the original author do it this way? It turns out that this would work as far as the relocation routine goes, but it would also change the ASCII codes in some cases (where they disassembled as three byte instructions). So a better solution was required, preferably in the same space. Here it is:

```
10 0C    BPL $0B89
C9 C0
         CMP -$C0
B0 08    BCS $B089
69 80    ADC -$80
(Carry is already clear)
```

For the *//e*, the correction can be entered by typing "**B7B: 10 0C C9 C0 B0 08 69 80**" and pressing [RETURN]. The effect of this change is that any address below $8000 or above $BFFF does not get changed, so we are not going to alter ROM addresses or ASCII codes (if high bit is clear, which is the way they are used in the RENUMBER program). Of course the jump address still has to be changed from $C86C to $D66C, but when the changes are complete PLE and RENUMBER can coexist peacefully in memory.

*J. Morris Prosser*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**Lee Webster**

WHEN faced with a package of 7 disks, housed in a blue plastic library case, it is surprising that the documentation is only a single 8 ½" x 11" sheet (printed both sides) containing the essentials of booting a disk and how the programs work (the latter instructions are also on each disk). (Yes, there is also a 4-page outline of the topics too.) Limited documentation?—not at all! That's more than enough for this package—just one sign of the quality of this offering in that no more documentation is needed!

What you have in this package are 6 disks packed with lessons and practice problems suitable for any general chemistry course—high school or college level. The seventh disk is a chemistry maze game.

These programs are excellent examples of "user friendly" or easy to use software. On booting any disk, you can ask to see the instructions. These explain: when the user is expected to respond (when he/she sees the > symbol on the screen), when to use the RETURN key (not always needed, such as in menu selection), and how to edit entries. In editing there are some unusual aids given to help the student. Rather than just mark an answer wrong, the program points out the location of errors in text responses. For example, when there are missing letters, misplaced letters, wrong letters, wrong case, etc. a series of symbols appear below the incorrect letters or positions. The usual right and left arrow keys are used for editing. Finally, at anytime in a lesson, the student can return to the lesson index by ESC, get help with CTRL-A, or go back a page with CTRL-B.

There is a lot in this package, so let's try to see a bit of each disk.

### Periodic Table (Disk 1)

With all the programs graphics are used for the type font which allows upper/lower case, larger letters for titles, etc.—all very effectively. On boot-up, you can choose to see the instructions (11 screens of information that are the same on each disk and also on the documentation sheet), to turn off the sound (useful if you want to use the program in the Library!), or get the Index of Lessons.

On this first disk there are 5 lessons (periodic table, names of elements, isotopes and atomic weight, properties of elements, and mystery elements). When you select from this Main Index, you get a "subindex" of individual lessons. For example, under "periodic table" there are: introduction; protons, neutrons and electrons; the periodic table; and review problems. When you return to the index, the lessons that you have completed have been flagged with an asterisk. On the Main Index, an arrow points to the last selection made. It is easy to keep track of where you are in the lesson plan.

The introduction section presents several screens of background information. Then you proceed with CAI (computer-aided instruction) lessons where material is presented in small chunks and questions are asked. When the response is correct, a pleasant musical beep sounds, and a sentence further explaining the problem is shown. If you are wrong, the beep isn't so pleasant, and a text line gives further help. You can't move ahead without the right answer. Later in the lesson, you sometimes get some of the earlier missed questions repeated.

The periodic table lesson on this disk effectively uses graphics to display the table. As a particular element is discussed, it is highlighted on the table to draw attention to its position (Figure 1). In the review problems, an element is highlighted in the periodic table and a question asked. You have to answer 8 questions correctly to complete this lesson. When you do get one wrong, often some information is given or the appropriate section of the table is highlighted.

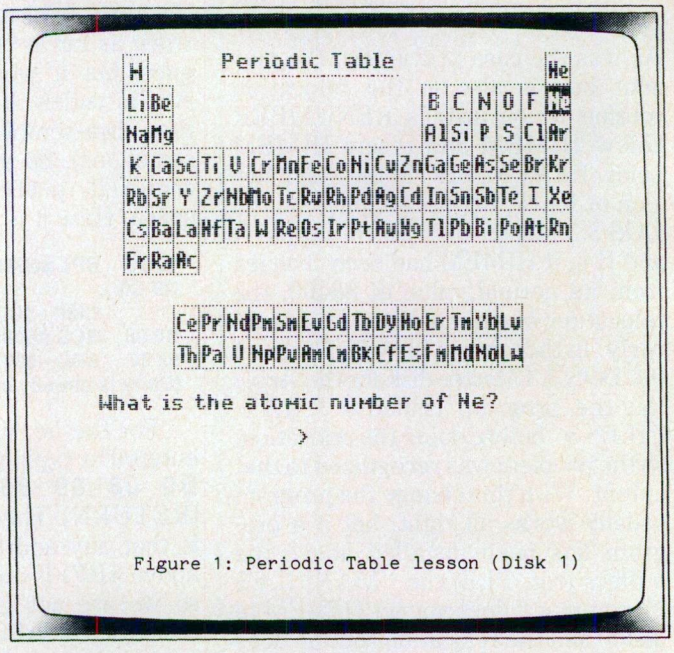



Figure 1: Periodic Table lesson (Disk 1)

The lesson on naming the elements begins by placing each element in the table, one by one, beeping(!), and showing the name and chemical symbol in large letters at the bottom of the screen. A series of practice problems follows where the student is asked to name 44 common elements (or in another part, all elements). If you give the wrong symbol, the program tells you its element name. If you get stuck, you can always use CTRL-A for the answer.

The lesson on properties of elements describes some properties and the student is to determine what element it is. Points are scored for correct answers. In answering, the student may type in the name, chemical symbol, or chemical formula. For the latter two, the program automatically capitalizes the first letter, and for formulas, all numbers are automatically displayed as subscripts. If you goof, an additional clue is given.

The best lesson on this disk is "Mystery Elements" which is a good review of all the topics. There are 14 unknown elements (labelled XA, XB, etc.). You are given the physical properties of an element (melting point, boiling point, density, color, and odor), and can select to run any of four tests (conductivity, reaction with water, reaction with a dilute acid, and burning in air). For these tests, graphical displays provide interest (Figure 2). Based on this information (and you can request it to be repeated), you place the unknown on the periodic table. Later you can check your "guesses" and grade your work.

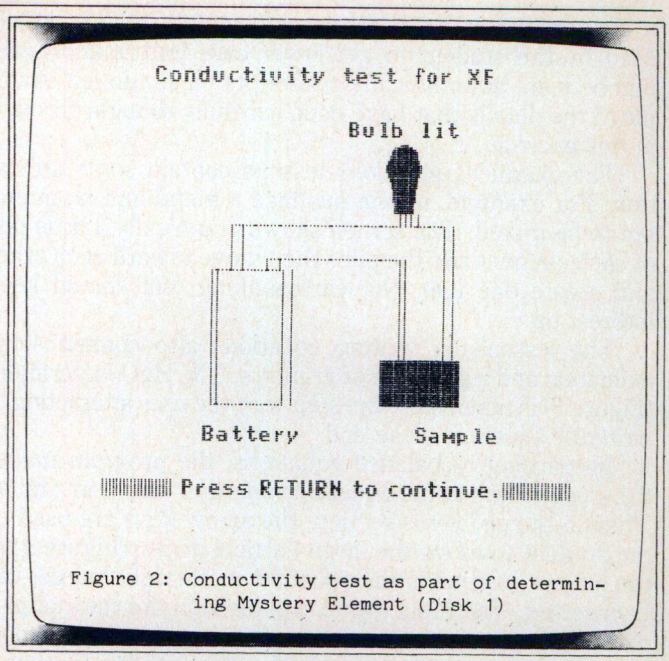


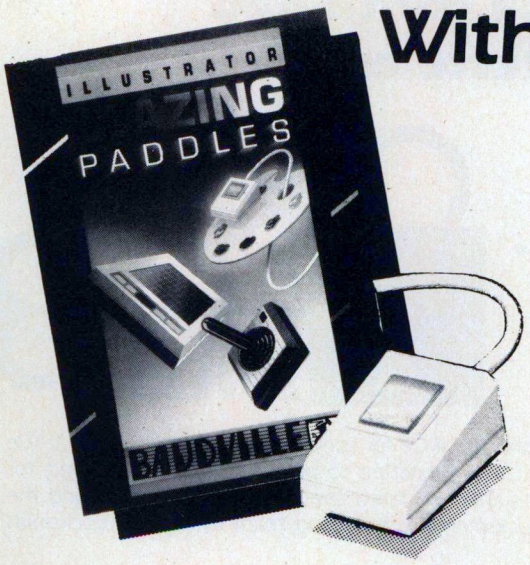

Figure 2: Conductivity test as part of determining Mystery Element (Disk 1)

## Nomenclature (Disk 2)

The naming of binary salts, variable oxidation state salts, two nonmetals, acids, bases, and ternary salts is covered in these lessons. For each topic, there is a set of practice problems where the student is given the formula and must enter the name of the salt or acid, etc. In another set of problems, the student is given the name and must enter the formula. The last lesson on the disk has 40 problems from all six topics. The editing marks which are given on incorrect answers are particularly useful for these lessons as the names that have to be typed in can be multiple, multi-syllable words. If you just miss one word or a letter or two, the whole answer isn't lost and you have another chance. I commend the program in making students keep at it until the answer is not only correct but spelled right too!

## Chemical Formulas and Equations (Disk 3)

The five main sections on this disk include: chemical formulas, chemical equations, writing equations, balancing equations, and problems.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In working with the lesson on formulas, the ESC key is used by the student to get lower case letters and again numbers are automatically subscripts—a continued example of the details that have been carefully thought through in this package.

The chemical equations lessons contain some animation. For example, in one instance a metal and nonmetal are to be mixed. The screen shows graphically a little pile of each element and the piles then move toward each other and create one pile. Not earthshaking, but should keep interest up.

The lessons on writing equations also contain some animation and a good use of graphics. The HgO experiment (Figure 3) is taken step-by-step with the user interacting to write the equation at the end.

In learning to balance equations, the program makes the student look at the equation and enter values in a table. Then in the problems section, the arrow keys are used by the student to move the large vertical arrow (Figure 4) to the proper position in the equation so the right integer can be inserted. The table (same type used in the tutorial part of the lesson) is updated as values are entered in the equation. When the student thinks he/she has the correct equation, a press of the RETURN key checks the answer.

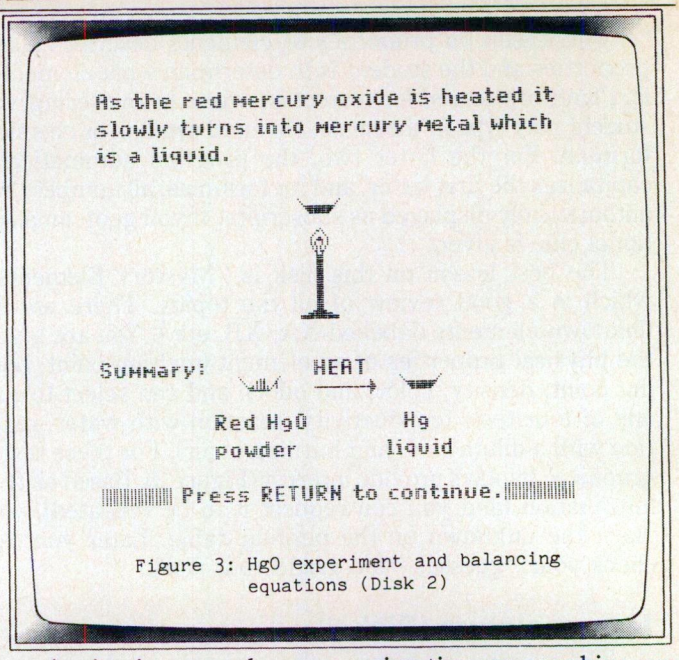

As the red mercury oxide is heated it slowly turns into mercury metal which is a liquid.
Summary:
HEAT
Red HgO powder
Hg liquid
Press RETURN to continue.

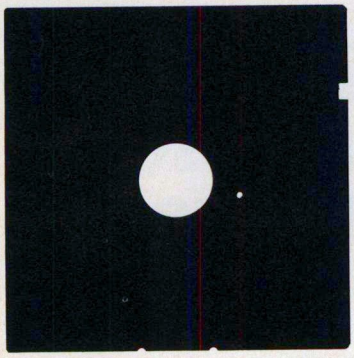
Figure 3: HgO experiment and balancing equations (Disk 2)

## Atomic Weights (Disk 4)

The main lesson groups on this disk cover chemical formulas (including ionic compounds, polyatomic ions, and hydrates), atomic weights, molecular and formula weights, moles and gram-atomic weights, and gram-mole conversion problems.

Again, in some lessons, animation or graphics are employed (e.g. showing an element placed into water, dissolving, and having the water evaporate). Color displays are used, but a black and white monitor will work since the text messages indicate the colors.

The atomic weight lesson puts emphasis (to be commended) on including the units in the answers. An answer is not considered correct unless the units are entered along with the numeric value. A lesson screen from this part is

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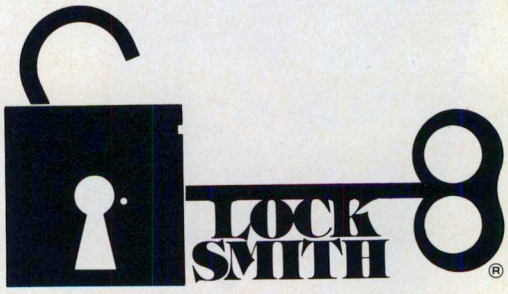


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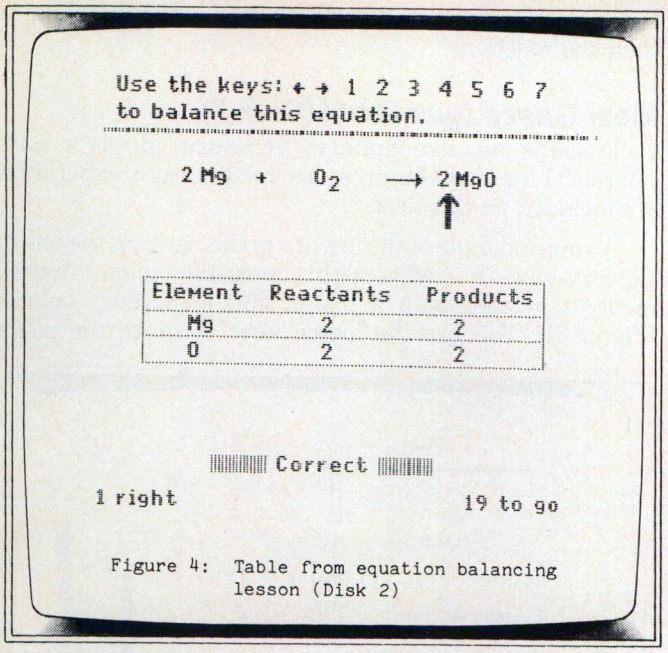



Figure 4: Table from equation balancing lesson (Disk 2)

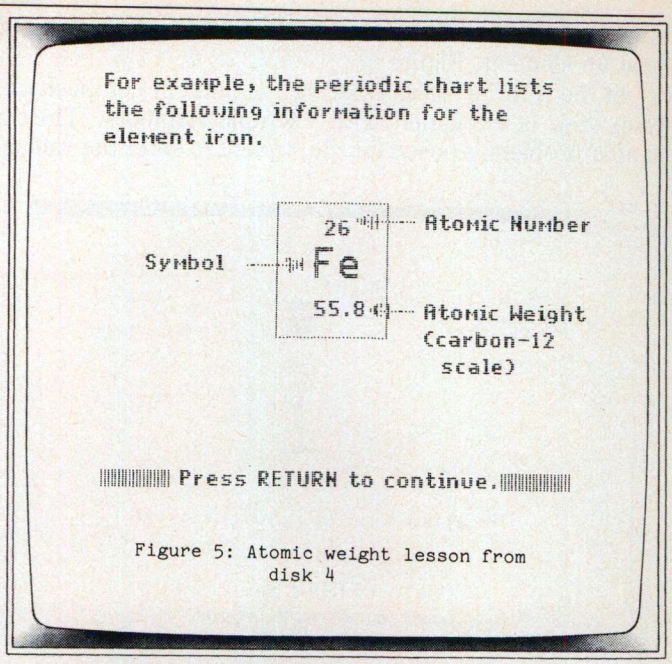


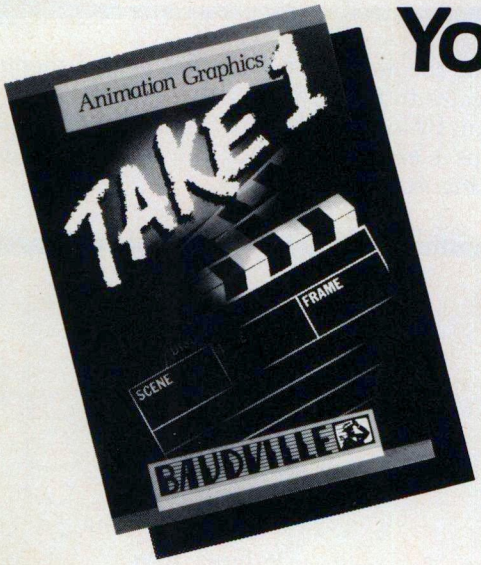

Figure 5: Atomic weight lesson from disk 4

shown in Figure 5.

In dealing with molecular and formula weights, the student needs to do some arithmetic calculations. Rather than require a separate calculator, the package allows the student to use the computer without leaving the program. With a CTRL-Q instruction, the user is in calculator mode and can enter multiplication, division, addition and subtraction problems. When he/she toggles back to the lesson, the calculator results are still on the screen for copying into the answer space.

## Percent Composition (Disk 5)

Of all the disks, this is the only one I had a little problem with loading. Occasionally I got that familiar grinding noise from the disk drive, but it always loaded eventually. This disk covers percent composition and empirical formulas. It does it, in part, by using experiments (KClO3 and Mg-HCl). In these experiments, each step is shown—for example, how to calculate the percent composition and then how to calculate the formula from the percent composition. Graphics showing simulated lab setups are included,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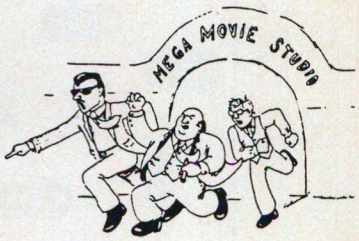


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with some interaction from the student (e.g. how long to heat an element, Figure 6).

In the tutorial for calculating the percent composition, each step is explained with example numbers. Then a similar problem is posed for the student to enter the values.

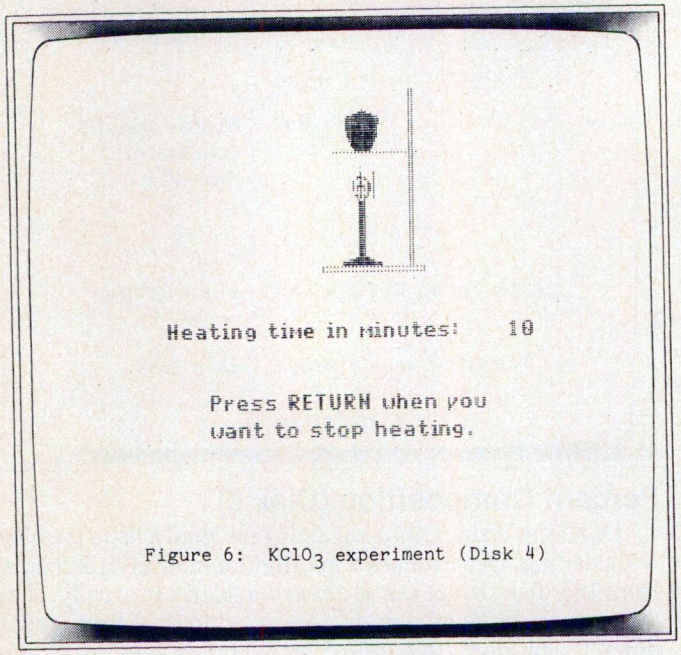


Figure 6: $KClO_3$ experiment (Disk 4)

## Chemaze (Disk 6)

The object of this game is to remove the obstacles by hitting them with the flask (Figure 7). The flask contains a reagent that reacts with the chemical in the obstacle. The beaker (the bad guy!) moves to protect—if it hits the flask and contains a chemical which reacts with the flask contents—boom, the game is over. You move through the maze, PacMan fashion, using the arrow keys and Q and A keys. To change the flask contents you move to one of the four corners of the maze. I didn't have much luck with winning this one—I don't have good enough reactions for PacMan, let alone a strong enough understanding of chemical reactions!

## Ideal Gases (gas laws) (Disk 7)

Lessons on atmospheric pressure, Boyle's Law, Charles' Law and the pressure-temperature experiment are included on this disk.

A good example of the lessons in this series is the one on Boyle's Law. It begins with a pressure-volume experiment—a system with a piston and a mercury column (Figure 8). You use the arrow keys to move the piston

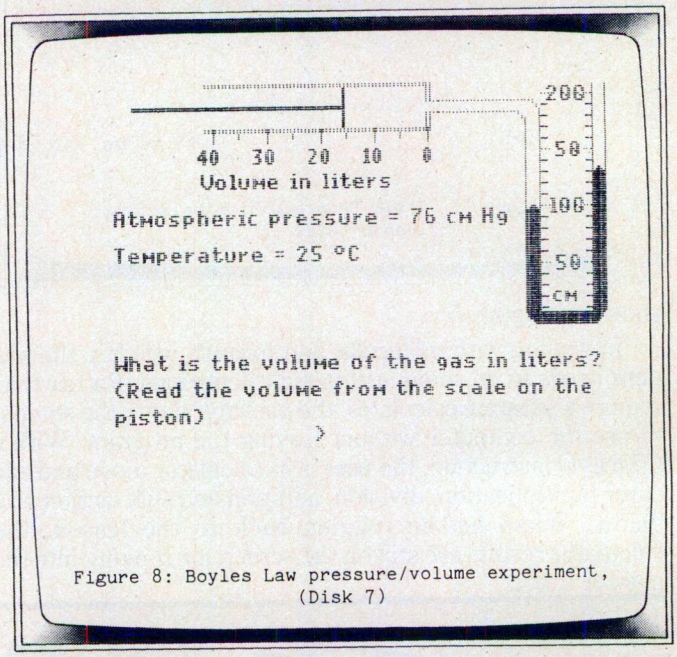


Figure 8: Boyles Law pressure/volume experiment, (Disk 7)

left/right and the mercury column reacts as it should. You read the scales to record data which is later displayed in tabular form. By looking at the data, you are able to see the relationships clearly. A plot of the relationship is also displayed (Figure 9).

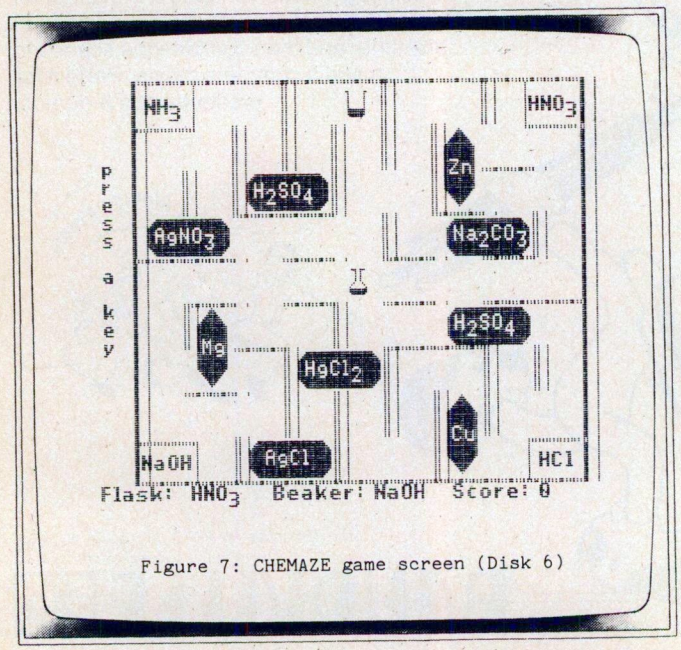


Figure 7: CHEMAZE game screen (Disk 6)

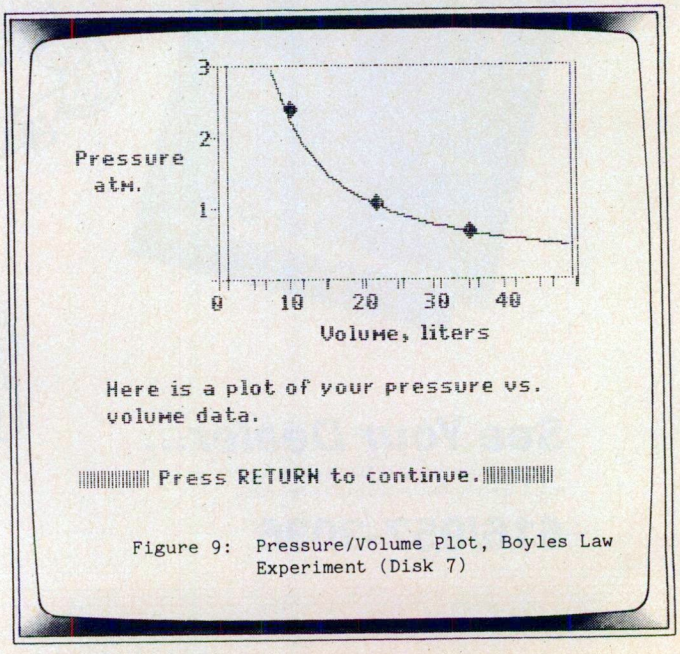


Figure 9: Pressure/Volume Plot, Boyles Law Experiment (Disk 7)

Example problems are then covered using Boyle's Law. Step-by-step, the student is led through the problem: identifying the pressure and volume values in the text statement of the problem, setting up the equations, and solving the equations. There is also an excellent drill available to practice setting up problems. Figure 10 shows the screen layout. At the bottom are 6 values or conversion factors. The student points to the appropriate one using the arrow keys, then enters a D (for denominator) or N (for numerator) and the selected item (in this example 1 atm/760 torr) is placed in the equation at the top of the screen. When all set, a press of the RETURN key causes the computer to calculate the value and display the answer on the line below the equation.

A similar approach is used for presenting Charles' Law and for the pressure-temperature experiment.

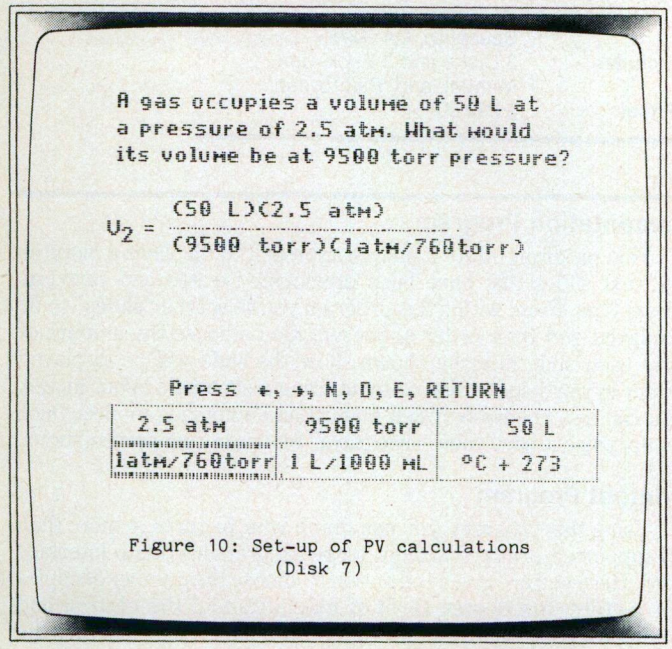
A gas occupies a volume of 50 L at
a pressure of 2.5 atm. What would
its volume be at 9500 torr pressure?
V2 = (50 L)(2.5 atm) / (9500 torr)(1atm/760torr)
Press ←, →, N, D, E, RETURN
2.5 atm
9500 torr
50 L
1atm/760torr
1 L/1000 mL
°C + 273

Figure 10: Set-up of PV calculations (Disk 7)

## Conclusion

This is a class package! Every part seems to have been carefully planned, and the execution is very effective. There is good use of graphics, adequate interaction by the user, and ease of operation. Although it doesn't cover ALL the topics in general chemistry (another disk, #8, "pH: Acids and Bases in Water" has been advertised), it does cover a wide range of subjects. I'm not saying how long ago I took a college course in general chemistry, but I certainly learned (or relearned!) some things working through this package. I have no doubt that instructors would be very happy having these programs available for their students to help them learn the subject. I'm not the only one to like this package, apparently, as a sticker on the disk envelopes indicates it received the 1983 "Best Microcomputer Software of Year" award by the Learning Periodicals Group. At $350 it isn't cheap, and I don't know the possibilities for discounts for multiple copies. However, one distributor I know of will sell individual disks at $50 each which might be a way for some to get started with this package.

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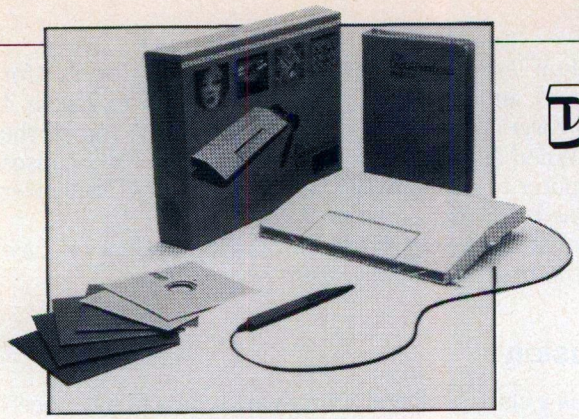

# Digital Paintbrush

| | |
|---|---|
| **Product:** | The Digital Paintbrush System |
| **Use:** | Graphics |
| **For:** | Apple II+ or IIe with 64K |
| **Company:** | Computer Colorworks<br>3030 Bridgeway<br>Sausalito, CA 94965 |
| **Includes:** | 3 Disks and 2 Back-ups<br>Manual, and 'Paintbrush' |
| **Price:** | $ 299.00 |

Larry Neibauer

Every so often, a new hardware or software product comes along that carries with it the promise of becoming a genuinely useful tool . The *Digital Paintbrush System* from Computer Colorworks—which offers the freedom of a light pen, the convenience of a mouse, and the versatility of a graphics touch tablet—is truly a new and unique approach to hi-res input and graphics design. It allows you the freedom to draw on, or trace from, any surface (i.e.cloth, paper, etc.) with a maximum working area of up to 10 ½ x 7 ¾ inches.

## Hardware

The system consists of a flat, rectangular housing unit, 11 ½ x 8 inches, and a pen which can be held comfortably in your writing hand. The tip of the pen is connected to the housing unit by two thin, dacron lines which wind around two spring-activated, paddle-like potentiometers mounted inside the main housing. Constantly checking input from the potentiometers, the software can precisely track the pen's position. The bottom edge of the housing unit has a clip to hold steady a pad of paper or other drawing surface.

The pen itself, which is also connected to the main unit by an electrical wire, contains two switches. One, in the tip, senses when the pen is pressed against the writing surface. A second, finger-activated switch is mounted on the pen's side. All input is fed to the computer through its game I/O port.

## Software

Also included in the system are five powerful programs and a utility package.

### Graphic Design Program

This program is used to create hi-res graphic displays. You can choose to DRAW (free-hand) using one of over twenty available brush tips, or draw lines, boxes or rectangles, circles and curves. You can fill any shape with color and choose from a wide variety of grid patterns. Enter the MICRO mode for detailed editing, or select the ALPHA option to add text (in one of fifteen available font styles) to your graphic displays.

When you have finished, save your picture or enter the EDIT mode to CUT a selected portion of the image, MOVE it, alter its size, and permanently STAMP the image wherever you like. You can also store and load pictures from a separate image library for use in your drawings.

### Text Screen Editor

The second program provides a quick and easy way to write, save or edit pages of text using a minimal amount of disk space. You may enter characters in normal, inverse, or flashing modes. Once you have finished entering text, the entire screen (40 columns x 24 rows) is saved as a "text slide" which uses up only 5 sectors of disk space (compared to 34 sectors for one hi-res screen). It is possible to save as many as ninety "slides" per diskette or over 180,000 words!

### Presentation Program

This program offers a unique approach to displaying pictures and text slides that have been previously created and saved as binary files. From within this program you select the "slides" to be displayed and their order of presentation, choose the amount of time each slide is to be shown, how the slide will be displayed (either in rapid succession or by utilizing a slow fade in/out mode). You can also choose between manual and automatic modes. Once set up, you can save your "slide trays" for use in later presentations.

### Printout Program

Using this program, you can dump your pictures to more than 35 supported printers without a special graphics dump interface card. Here you are given the option to choose the number of copies per picture, the degree (1-5) of magnification, the vertical and horizontal position of the printout on the paper, and whether the printout will appear in normal or inverse mode.

### Telephone/Graphics Program

This brings us to the fifth and probably most unique program in the system—Telephone/Graphics. With this program you can utilize color graphics to communicate ideas visually over the phone. With it, you and a partner can interactively create drawings, interchangeably draw and talk, and send drawings to one another via the telephone lines in real time. You and the remote party can view the same drawing on both screens and watch as both of you modify it. You can discuss your modifications over the phone while they are being made, and conversely, use the drawing as a way to emphasize your ideas and verbal communication.

Nothing more is needed to utilize this feature than a telephone, a modem, (either a Hayes Micromodem II, Novation Apple-cat II or a Hayes Micromodem IIe) and a 2-for-1 modular telephone connector at both ends.

### Utility Pack No. 1

On this disk are the text fonts and library images, and there is also a program (GRAPH GRABBER) that allows you to use graphs created with Software Publishing Corp's PFS:GRAPH, a program to adjust the potentiometers, an interface program that allows you to use the system with your own software, and a program to draw or trace enclosed shapes and determine the areas of these shapes.

### Conclusions

At this time I have only two criticisms of the Digital Paintbrush System. First, although you can load and edit any standard binary hi-res file, the system cannot utilize custom fonts other than those supplied on the utility disk. Second, I found the amount of actual desk space required by the system—roughly a 20 x 15 inch area—to be somewhat awkward if your available space is at a premium. I plan to give more details about the system's overall performance in a later article.

# A.P.P.L.E. Doctor

**Bruce F. Field**

## WORDSTAR DOUBLE-PRINT

A couple of months ago I had a question about using Wordstar with two printers. I suggested that the person keep two copies of Wordstar, each configured for one of the printers. George Kinal has come through with another solution...

"Serial interface cards are typically used in slot #2 of the Apple II. If you are using a word or text processor under CP/M, and you have a serially interfaced printer either as the primary or as an additional printer, you may wish to patch CP/M for LIST output on slot #2 (this also allows use of the ctrl-P toggle for printer activation). I personally use a serial interface for both modem and printer operation (not simultaneously, of course), with a simple switch box to select modem or printer connection.

The following applies to Softcard CP/M version 2.23 (so-called 60K CP/M). The disk to be patched should have DDT.COM, from the system master disk, on it. Run DDT (type "DDT"). Use the DDT "S" command on location F392, changing it from the value 55 to 69:

1. Type SF392 [cr].
2. screen should display F392 55.
3. Type 69 [cr].
4. type ctrl-C to exit DDT.

This changes the LPT vector to point to the same location as the PUNch device (slot 2). Use a ctrl-C to exit from DDT. If your needs are temporary, this quick modification in memory is all that is needed. Try it: type ctrl-P, which will activate the printer.

If you want to permanently incorporate this modification onto the system tracks of a CP/M disk, then you should run MBASIC CONFIGIO (again from the system master), and follow the prompted instructions to write the I/O Configuration Block to disk (command #4). Now, this patched operating system will always have slot 2 as the LIST (printer) device."

## APPLE II SUPER EXPANSION?

**Q.** *I am interested in an expansion board, similar to one I heard Mountain Computer used to make. Do you know anything about it? Is Mountain Computer still in business? The board I'm talking about is actually a box that has about seven additional slots for the Apple II's peripheral boards. How does it work? Is it worth the trouble? Can one be home made? Does it switch between two banks of 7 slots, or can all 15 slots be used at one time?*

**A.** I have not heard from Mountain Computer in a long time but I believe they are still supplying music boards and thus are probably still in business. The expansion chassis they made (make?) consisted of a box with 8 slots that could be bank switched in place of the slots in the Apple. A separate power supply was included for the extra slots. A card containing quite a few ICs plugged into one of the Apple slots to connect the chassis to the Apple. The price in 1981 was $650.

I have seen an ad recently for another manufacturer that makes a cable to bring the peripheral bus outside the Apple, but I'm skeptical of this. Douglas Electronics, 718 Marina Blvd., San Leandro, CA 94577, telephone (415) 483-8770 makes a set of Apple compatible boards designed to be a stand alone computer. It's possible that they may have an interface card designed to connect their motherboard to the Apple.


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The address and data lines from the microprocessor in the Apple go the the peripheral card slots. If one is not careful, adding extra wiring or chips can easily exceed the ability of the Apple to properly drive the extra circuitry, in which case everything comes to a screeching halt. Special drivers must be added to boost up the signals before sending them to an expansion board, and care must be taken to make sure the timing relationships between the signals (both outgoing and incoming) are correct. An expansion board is probably a job for experienced circuit designer.

**Q.** *I am currently in the process of creating an all-purpose sports statistics program in Applesoft for use at my school. Having arrived at the need to include a turnover ratio statistic, I ran across the problem of rounding off ratios calculated to six or more decimal places to three or four places. How can this be done?*

**A.** This goes right along with the previous question. The easiest way to round numbers is with the following piece of code. If we want to round the variable A to three places:

```
A = INT(1000*A + .5)/1000.
```

A is multiplied by 1000, rounded to the nearest integer, and then divided by 1000 to return it to its original value minus the extra digits. This works fine until it is time to print it and then you run into the problem described above of getting extra digits. Note that the number is not substantially different than what it should be, but the extra digits are a pain if you are trying to line up columns. The easiest way to format numbers for printing is to use one of the machine language number formatting routines available. Several have been advertised in magazines. Amper-Magic by Anthro Digital, Inc., Amperware by Scientific Software Products, Inc., Routine Machine by Southwestern Data Systems, Inc. now called Roger Wagner Software, and AmperSoft by MicroSparc, Inc. are a few that offer print using features. A very nice utility by Craig Peterson "Print Using & Friends" was published in *Call -A.P.P.L.E. in Depth, Number 1* and will also handle the problem.

However for quick and dirty programs the following program segment will round to three digits.

```
200 A$ = STR$(INT(1000*A + .5))
210 A$ = LEFT$(A$,LEN(A$)-3) +
         "." + RIGHT$(A$,3)
220    PRINT A$
```

## DECIMAL-BINARY IMPRECISION

**Q.** *What's wrong with the Applesoft print routine? Certain numbers cannot be printed without additional incorrect digits being added to the end of the number. For example: PRINT 6.017 always prints as 6.01700001. I cannot get rid of the extra digits except by converting the number to a string and printing the string. This bug played havoc with an Applesoft column formatting routine I tried to write before Craig Peterson's Print Using and Friends came to my attention. His routine solves the practical problem, but why does it happen?*

**A.** I seem to remember answering this question once before, but it turns up rather regularly. The answer has to do with the way Applesoft stores numbers in the computer memory. If you type a number in as part of a program Applesoft stores the ASCII code for each digit into a byte of memory, so when you list a program you get exactly the same number back. On the other hand, when the number is put in a variable, printed, or used in an arithmetic operation it is first converted to a binary number. We have to digress a minute to discuss binary numbers. A binary number such as 1011.101 is 11.625 in base 10. The position just to the left of the binary point has a value of 1, the next digit to the left is worth 2, the next 4, and the leftmost is worth 8. Thus the integer part is 8+2+1 = 11. The position just to the right of the binary point has a value of ½ or 0.5, the next to the right is ¼ or 0.25, the next 1/8 or 0.125 and so forth. The problem is that it is impossible to express some decimal numbers exactly in binary, the binary number would require an infinite number of digits (or at least more than the 32 that Applesoft uses). Therefore with a number like 6.017 Applesoft uses 6.01699999 or 6.01700001 depending on how you calculated it.

# MEMBER BILLBOARD

Don Elman

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From its very inception, A.P.P.L.E. has been conceived as a mutually-supportive group of Apple computer enthusiasts. When A.P.P.L.E. was a small, local club operating on a shoestring, the legal form of its organization was less important than it is today. We now maintain a large, international membership with increasingly sophisticated needs, and are reaching out to serve the broadening group of new computer users.

At our September 18, 1984 meeting, the membership unanimously approved the restructuring of A.P.P.L.E. into a member-owned cooperative. By officially defining ourselves as a co-op, we are laying the groundwork of efficiency, financial responsibility, and fairness that both allows us to continue our high quality of services and assures our stability in the years ahead. All current A.P.P.L.E. members are automatically Charter Members of the new co-op.

The immediate changes which you may notice should be minimal. Our new official name, **A.P.P.L.E. Co-op**, will soon appear in our publications and in the greeting you hear when calling our main phone number. Otherwise, product orders and magazine subscriptions will continue to be serviced as before.

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Here's another benefit of co-op membership. One of our fine Puget Sound computer dealers is offering a 15% discount off the list price of any Macintosh hardware and software for current members of A.P.P.L.E. Co-op. This applies to mail orders as well as in-store purchases, and your A.P.P.L.E. membership number and expiration date must accompany each order. Contact *Emerald Computers, 23215 58th Avenue W., Plaza Shopping Center, Mountlake Terrace, Washington 98043, (206) 778-9826.*

We also remind local members that special "A.P.P.L.E. member" prices are available on Apple products from *Empire Electronics, 616 SW 152nd, Seattle, Washington.*


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When we sent *Apple User* a copy of *A Christmas Adventure,* we were expecting nothing more than a review. What we got instead has a 6 a.m. phone call from an ecstatic software editor.

"Ripping! Super!" (He loved it!) Loved solving the mystery of Santa's strange disappearance on Christmas Eve; the surprise action sequences and the dazzling graphics; and all the rib-ticklingly funny episodes we've put into the program to make *A Christmas Adventure* a pure Christmas delight.

When the editor finally discovered how to access Santa's computer, and saw his *own name* scroll by on Santa's gift list, he knew that he'd found it—that special program he'd been looking for with which to launch the magazine's software line. A program so different, so appealing...

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(He was shouting at this point, his British reserve now completely dissolved).

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### SURVEY

**What one computer do you currently use most?**

A ☐ *Apple II*
B ☐ *None*
C ☐ *Apple IIe*
D ☐ *Other (specify)*

**What hardware product are you most likely to buy in the next 4 months?**

E ☐ *Hard Disk*
F ☐ *5 megabyte*
G ☐ *10 megabyte*
H ☐ *20 megabyte*
I ☐ *8086 board for your Apple (run IBM P/C software)*
J ☐ *Apple keyboard (increase capability)*

**What computer language would you likely purchase in the near future?**

K ☐ MBASIC.MAC
L ☐ PASCAL
M ☐ MODULA 2
N ☐ ADA
O ☐ LISP
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# THE MARKETPLACE

The following items are selected by our editorial staff from the large number of product announcements and news releases sent to us daily. They are presented solely to keep you informed about the current market for Apple related hardware and software. As we have not tested many of these products, appearance here does not necessarily represent endorsement or recommendation by A.P.P.L.E. Watch for evaluative reviews in *Call — A.P.P.L.E.*.

## MUPPET LEARNING KEYS FOR PRESCHOOLERS

Koala Technologies Corp., of Santa Clara, Calif. announced today that it, with Henson Associates Inc., and Sunburst Communications have developed Muppet Learning Keys, Kids' Computer Keyboard.

The Muppet Learning Keys—a novel, low-cost computer peripheral—helps children age three and up learn letters, numbers, and colors with the assistance of the Muppets.

Muppet Learning Keys, Kids' Computer Keyboard simulates the familiar contents of a child's school desk—ruler, water color set, penmanship slate, compass, eraser, and arithmetic exercise book—to help a child learn basic skills. There is even a comic book on the desk to provide command keys for the programs. Kermit the Frog, Miss Piggy, Gonzo, and Fozzie Bear provide friendly and humorous instruction.

The new product is a sturdy yet lightweight unit that depicts school desk materials on a mylar surface over a circuit board. It connects to a computer display screen through the paddle port on the Apple.

Muppet Learning Keys for the Apple *//*c or *//*e has a suggested retail price of $79.95.

## THREE PROGRAMS INTRODUCE LOGIC AND PROGRAMMING SKILLS

Sunburst Communications, Inc. of Pleasantville, NY, has released three new programs to teach students logical thinking and simple programming skills.

ARROW DYNAMICS, for grades 4–12, combines the challenge of chess with the structure of programming to give students practice in logical thinking and the formulation of strategy. The object of the game is to move an arrow across a game board to one of two goals using special programming statements. Obstacles, prisms and mirrors may be added to the game to increase the challenge and enhance creative thinking. ARROW DYNAMICS can be played alone, cooperatively or competitively with another player, or as a puzzle. The Apple version contains an editor option which allows teachers or students to create their own puzzles.

SPECTRUM, for grades 6–12, is a logic game designed to give students practice in pattern recognition, prediction, logic and inductive reasoning. The object of the game is to determine a hidden pattern of colored bars or shapes with as few clues as possible. The hidden pattern is generated by a program that is written by the computer or another player. To discover the pattern, students obtain clues by requesting the color or shape of a specific bar (bar#2, bar#13, bar#20, etc.). Students continue to request clues until they think they have abstracted enough information to make an intuitive hunch about the pattern. Once the pattern is recognized, the students try to duplicate it by writing their own program to reproduce the pattern. For one to four players, SPECTRUM has nine difficulty levels.

BLAZING THE BASIC TRAIL, for grades 7–12, is an introduction to BASIC programming using IF–THEN and GOTO statements. The program begins with an initial set of conditions—a shape or set of shapes. Then, students are asked to select one target shape from five available shapes. The shapes are like variables, whose initial values (hat, tree, shirt, mask, flag) are changed by successive program statements when the program is run. The students must sequentially place computer-generated statements into a program that will transform the initial shape to match the selected target shape. For one to four players, the program has nine levels of difficulty. It can be played alone or competitively.

Each program includes one diskette plus a backup and an extensive teacher's guide. For a free 30 day preview, and more information, call Sunburst at (800) 431–1934; in New York, Hawaii and Alaska (914) 769–5030.

## SORTING IT ALL OUT

Exploring Sorting Routines is designed to aid in teaching high school and college students about the use of sorting routines in computer programming using BASIC.

Four programs describe and demonstrate each of seven different sorting routines. With these programs, students have an opportunity to become familiar with and compare the operation of each sorting method. The four programs include CLASSROOM DEMONSTRATIONS, INDIVIDUAL DEMONSTRATIONS, SORT COMPARISONS, and VISUAL SORTING DEMONSTRATIONS. Included with each program are student activities, transparencies, and handouts.

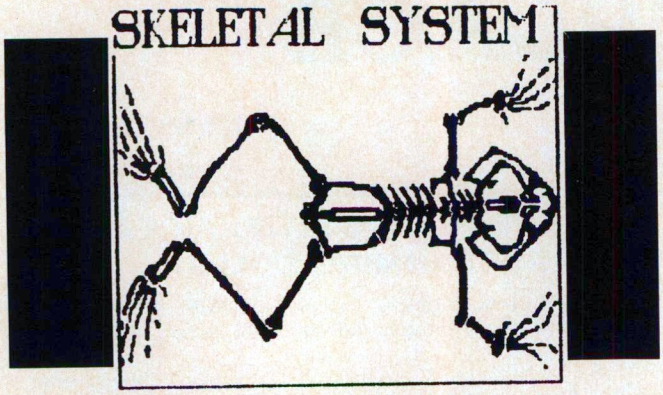
Exploring Sorting Routines—Apple II series, 48K diskette with backup and 37–page teacher's guide—$36.00.

## SCIENCE SERIES

Ventura Educational Systems announces the release of a new line of science learning systems for Apple computers. These educational software packages are designed for school and home use and feature instructional high-resolution graphics and an interactive mode for presenting essential facts about each subject.

The titles include:

VISIFROG: Vertebrate Anatomy—Topics include musculature, digestive system, cardiovascular system, nervous system and the skeleton of the frog.

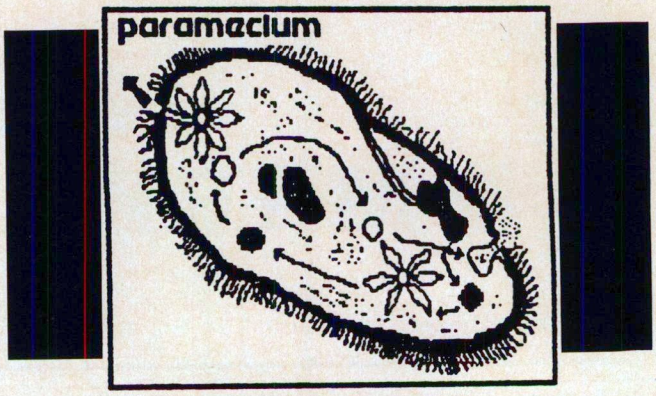



CHEMAID: Introduction to the Periodic Table—Provides a structure for understanding the periodic table of elements according to classifications. Using the data retrieval utility, students can instantly access the essential information about any of the elements.

SENSES: Physiology Study Unit—Presents the parts of the human sense organs and their functions.

THE WORM: Invertebrate Anatomy—Deals in detail with the digestive, nervous, circulatory, reproductive and locomotive systems of the earthworm.

PROTOZOA: Microorganisms—Features four representative members of the protozoa phylum: Amoeba, Euglena, Paramecium and Plasmodium (malaria cycle). Also includes a special unit providing detailed information on how to operate a microscope.




The retail price of each product is $39.95. For additional information about these products or a free catalog of our complete line of educational software, call or write: *Ventura Educational Systems, 3440 Brokenhill Street, Newbury Park, CA 91320, (805) 499-1407.*

## MORE THAN A CLASSICS COMIC

International Software Systems (ISS) of Richmond, Virginia announces "Reading Skill Adventures with Gulliver's Travels." Written for grades two through five, this interactive story contains hours of entertaining reading as Gulliver encounters new and exciting adventures.

ISS combines computer interaction, color graphics (some even have action), and text to create interactive stories. As children read Gulliver, they control the plot line, discovering dozens and dozens of story lines and endings. With three levels of vocabulary, children can reread adventures with more challenging words.

Highlights include:

1. A fully developed interactive story;
2. Story plot control through simple interaction with the story produces dozens of different plot lines and endings;
3. Multiple vocabulary levels present new & challenging words;
4. Partial screen graphics with text combine to form a unique "book" appearance.

For further information, contact *Rich Slight* at *(804) 359-2211.*

## COMBINING PROBLEM-SOLVING WITH ENTERTAINMENT

*Allen, TX* — DLM introduces Freddy's Puzzling Adventures for the Apple II+, *IIe*, and *IIc*, an educational software program created to stimulate problem-solving and logical thinking skills through fun activities.

The program consists of three activity sections: Number Puzzle, Word Puzzle, and a customized Word Puzzle. Children can try their problem-solving skills with numbers or words, or create their own challenging word puzzles.

Designed for children ages 7-12, the program encourages children to practice problem-solving and strategy skills to complete the puzzles. Each puzzle prompts the child to move letters or numbers into a logical, sequential order, similar to the popular, handheld puzzles. The number of moves required to complete the puzzle are tracked and appear on the screen. State-of-the-art graphics, sound and animation reward a child's efforts for completeing a puzzle correctly.

In Number Puzzle, a child moves numbers, one at a time, along paths and in and out of boxes. In Word Puzzle, a child rearranges scrambled letters, moving one letter at a time, to spell two-, three-, and four-letter words. In addition, the child can create his or her own word puzzles.

A 12-page user's guide, key chart insert, and game diskette are included in the package. Suggested retail price is $29.95.

For more information on DLM's software call: *Pamela Connell* or *Charlca Beene,* toll free at *800-527-4747 (800-442-4711* in Texas).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## CASTLES OF THE MIND

MIND CASTLES I is a logic program designed for use by students aged 8–13. Students find themselves trapped in a Victorian Castle where they must use logic and reasoning to escape. They are aided by Mr. Winn, a guardian who speaks in rhymes. As students solve puzzles, they work their way up to the mysterious tower of the six-story mansion.

MIND CASTLE II is an advanced logic program for use by students aged 12 to adult. An old library book leads the student to a boarded-up castle, haunted by specters from ages past. The goal is to use reasoning to solve challenging logic puzzles in the quest of the treasure in the tower.

High-resolution graphics depict the forty-five castle rooms and puzzles. The programs' vocabulary and the castle rooms have been carefully researched to assure their Victorian authenticity.

The two MIND CASTLE programs are designed to be used alone or with the two logic instructional programs (THE 4TH R—REASONING and REASONING: THE LOGICAL PROCESS) produced earlier this year by MCE Inc. For more information contact : *MCE Inc., 157 S. Kalamazoo Mall, Suite 250, Kalamazoo, MI 49007. 800-421-4157 (616-345-8681* in Michigan).

## NATIONAL CHILDREN'S WRITING CONTEST

*New York, NY —September 18, 1984—* Scholastic Inc., the educational publisher, announced that it is sponsoring a writing awards contest based on the use of the company's innovative creative writing software program—STORY TREE. Apple Computer is co-sponsoring the contest, which will be open to school children throughout the country.

STORY TREE is an interactive story-processor that allows young writers to create stories that branch out from one beginning to many different endings. To enter the contest, writers must submit a story composed with STORY TREE, using the program's branching feature. Applications will appear in educational magazines such as *Electronic Learning* and *Teaching and Computing* and may be photocopied.

Prizes for the STORY TREE writing contest will be awarded on three different levels—Elementary (Grades 4–6), Junior (Grades 7–9), and Senior (Grades 10–12). Prizes for each category include the grand prize of a $1000 Scholarship or an Apple *IIc*, as well as second and third prizes of $500 and $250 Honorable Mentions. In addition, ten in each category will receive a $100 software gift certificate. Also, each of the winning student's classrooms will receive and Apple *IIe* computer. A panel of noted educators and authors will judge entries. Stories will be judged on originality and how creatively they incorporate the branching aspect of the program. All entries must be received by April 1, 1985 and winners will be announced in May, 1985.

STORY TREE, is available for the Apple II family as well as other computers. The package retails for $39.95 and comes with a program disk, a story disk, and a reference manual. The school version, priced at $59.95, also includes backup disks, a student activities guide and a teacher manual. Contact: *Avery Hunt, Vice President, Communications (212) 505-3410.*

## DATA BASE FOR SCHEDULING, ATTENDANCE, REPORT CARDS, AND LETTERS

HARTS III, an administrative microcomputer software system, can perform scheduling for schools with enrollments up to 3,000 students. An amazement to school principals and guidance counselors who are used to working by hand or with distant service bureaus, HARTS III schedules a school of 1000 students in about 4 minutes, keeps period attendance up to the hour, and produces report cards immediately after the end of a grading period. The 150 programs in the package also do grade statistics, mailing labels, letters to parents and other, often manually done, paper work. More than 150 school systems in the U.S. and Canada have installed the system.

School & Home Courseware, Inc. has a free-loan videotape demonstration of the HARTS System. Educators wishing to see the HARTS III Administration System videotape at their leisure, should call or write *Simone Nelson* at *HARTS III, c/o School & Home CourseWare, Inc., Department NR, 301 West Mesa, Fresno, CA 93704 (209) 431-8300.* Be sure to tell which videotape format you use: ¾" U-Matic, ½" VHS, Beta I or Beta II.


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**10K More Memory**

Use HIDOS command in hello program for turnkey startup, adding 10K free memory to run 30% larger Applesoft programs than ProDOS. Moves DAVID-DOS II and 4 buffers above main memory.

**Ultra-Fast Garbage**

New FRE command collects a memory full of 6000 strings that are half garbage in two seconds. DOS 3.3 takes 12 minutes. FRE is so fast it is not noticeable during run of most programs.

**Clock Dating**

Automatic date stamping of disk files is set up for 6 kinds of clocks or Hello manual date entry. New DATE command will auto-insert date in correspondence.

| All times in seconds. (Time Test programs available) | | DAVID DOS-II | ProDOS | DOS 3.3 |
|---|---|---|---|---|
| TEXTFILES (100 Sectors) | TSAVE | 8.0 | NO | NO |
| | TLOAD | 6.2 | NO | NO |
| (791 Strings, | WRITE | 29.3 | 28.0 | 88.4 |
| 32 chars ea) | READ | 24.3 | 16.3 | 83.8 |
| | PRINT/READ | 44.2 | 45.9 | 117.1 |
| (442 Sectors, 7 x 500) | APPEND | 142.3 | 142.9 | 1231.2 |
| APPLESOFT (100 Sectors) | *SAVE | 6.4 | 16.4 | 33.1 |
| | LOAD | 5.0 | 4.0 | 23.5 |
| INTEGER (100 Sectors) | *SAVE | 6.6 | NO | 33.4 |
| | LOAD | 4.9 | NO | 23.4 |
| BINARY (100 Sectors) | *BSAVE | 7.3 | 18.4 | 28.7 |
| | BLOAD | 5.8 | 4.8 | 24.5 |
| 48K PROGRAM SPACE | APPLESOFT | 36,352 | NO | 36,352 |
| (With 3 Bufs avail) | INTEGER | 36,352 | NO | 36,352 |
| | BINARY | 36,352 | 34,816 | 36,352 |
| 64K PROGRAM SPACE | APPLESOFT | 46,592 | 32,256 | 35,756 |
| (With 4 Bufs avail) | INTEGER | 46,592 | NO | 35,756 |
| | BINARY | 46,592 | 41,728 | 35,756 |

*Add 5 seconds for Verify. Apple II, Applesoft & ProDOS are trademarks of Apple

**Ten New DOS Commands**

1. HIDOS moves DOS above 48K memory.
2. FRE makes ultra-fast garbage collection.
3. DATE stamp files. Clock or manual dating.
4. TLOAD speed loads all Text Files to mem.
5. TSAVE speed saves Text Files from memory.
6. TLIST lists all Text Files to screen/printer.
7. DUMP Binary/Ascii to screen or printer.
8. DISA disassembles Binary to screen/printer.
9. AL prints program Address & Length.
10. / is a one keystroke Catalog.

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All new commands operate identical to old DOS commands on the keyboard & in programs.

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**** ALL GRAPHICS (from page 1 or 2); LOW RES, HI RES
**** MIXED GRAPHICS AND TEXT
**** TITLES AND COMMENTS with your printout
**** KOALA SCREEN (normal or magnified)

*** PRINT WHILE USING DOS OR BASIC COMMANDS
*** CHANGE PRINTER SET UP WHILE ANOTHER PROGRAM IS RUNNING

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  Graphics printer interface (like GRAPPLER)
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## APPLE ANNOUNCES THE MACINTOSH 512K

*Cupertino, CA —September 10, 1984—* Apple Computer today introduced a new Macintosh personal computer with 512 kilobytes of internal memory. The powerful business computer enables users to take advantage of larger documents and models, faster response time, and the more than 40 business productivity software packages now shipping.

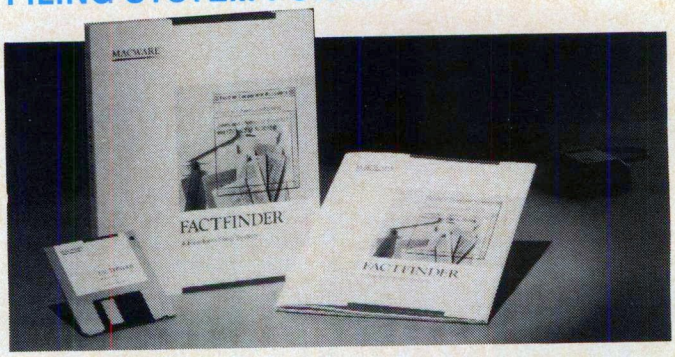
The latest addition to the Macintosh product line—introduced several months ahead of schedule due to the significant quantities of 256K chips now available—offers users another option in choosing the Macintosh system that best fits their needs.

The Macintosh 512K has a suggested retail price of $3,195. In addition, Apple also is announcing a price reduction and 512K memory expansion for the Macintosh 128K system. The Macintosh 128K will sell for $2,195. The 512K memory Expansion Kit will be available for $995.

Macintosh owners can expand their 128K systems to the Macintosh 512K at authorized Apple dealers and service centers. The expansion can be completed in less than 30 minutes by replacing the Macintosh digital board.

For Macintosh 128K customers who purchased their systems before September 10, 1984, Apple will provide a free copy of MacProject and MacDraw—following a brief demonstration from an Apple dealer—if they purchase an expansion kit by March 31, 1985.

## FILING SYSTEM FOR MAC




*Mountain View, CA —* Forethought, Inc., has introduced the first product from its new Macware software publishing effort. Called *Factfinder*, it is a free-form filing system for use on the Macintosh.

With Factfinder, the user stores information in a factsheet window. The size of the factsheet is limited only by the computer's memory. Text can be entered and edited free form from the keyboard, cut and pasted from the Macintosh clipboard, or loaded from MacWrite or MacTerminal text files. Any number of factsheets can be grouped into a stack, with the program providing a complete index of each stack's contents.

To reference or cross reference each factsheet, the user simply designates key words or phrases. Factsheets also can be accessed by their individual titles or by creation or modification dates, which are automatically assigned by the program.

Other features of the product include pull-down menus and task-specific windows. Factfinder is compatible with the Apple Lisa Computer models 2/5 and 2/10 with MacWorks. It interfaces with the TECMAR MacDrive and Davong Systems Mac Disk. The product, priced at $150.00, will be available by November 1, 1984 through computer dealers.

## ASSEMBLER FOR MACINTOSH

Mainstay announces MacASM, an integrated assembly language development system for the Macintosh computer. MacASM offers an integrated full screen environment. No separate use of an editor, an assembler, a linker, a resource compiler, and debuggers is required. All parts of the Edit-Assemble-Debug-Edit cycle can be done from within the MacASM full-screen environment.

MacASM offers a flexible assembler and full macro capability. Source code may be assembled from memory or disk to memory or disk. MacWrite and MacASM are mutually compatible. Source files generated with MacASM can be edited with MacWrite and vice versa.

MacASM is currently being offered for an introductory price of $100. Contact: *Mainstay, 28611B Canwood St., Agoura Hills, CA 91301, (818) 991-6540.*

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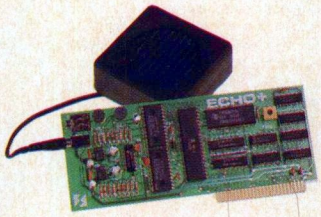


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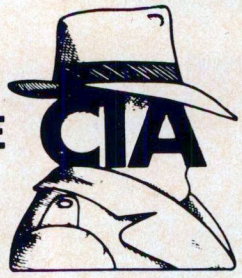

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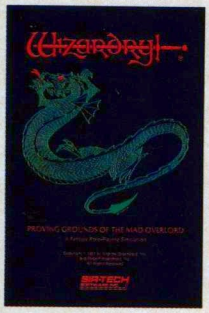

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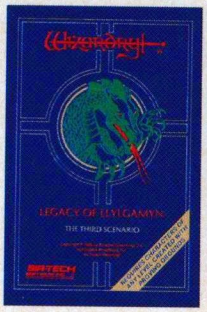

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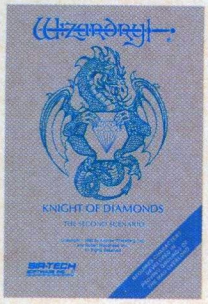

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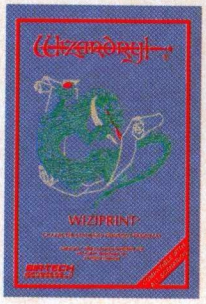

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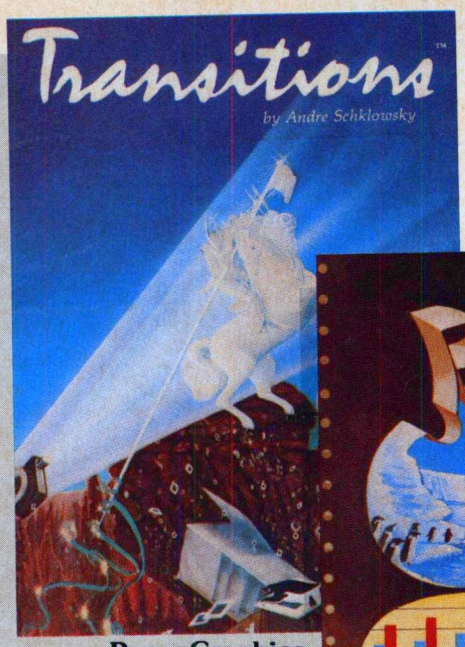


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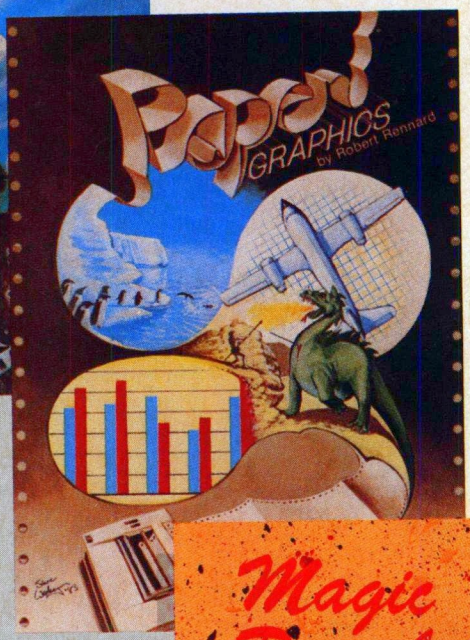


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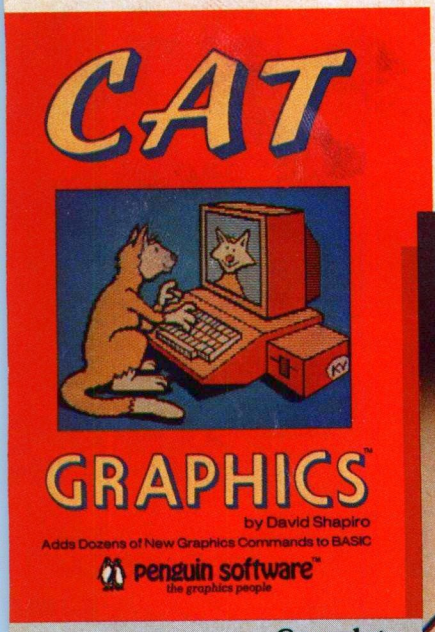


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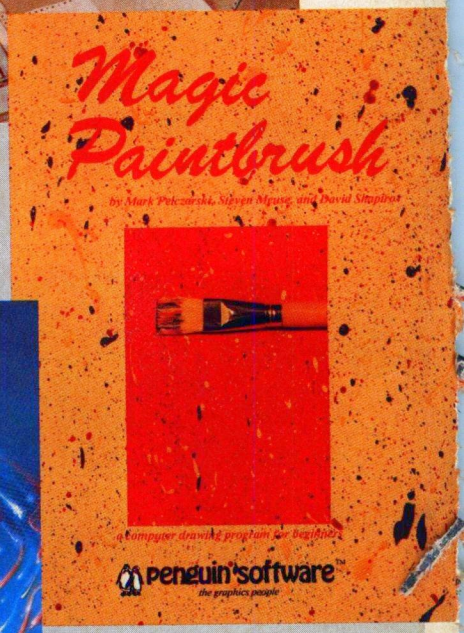


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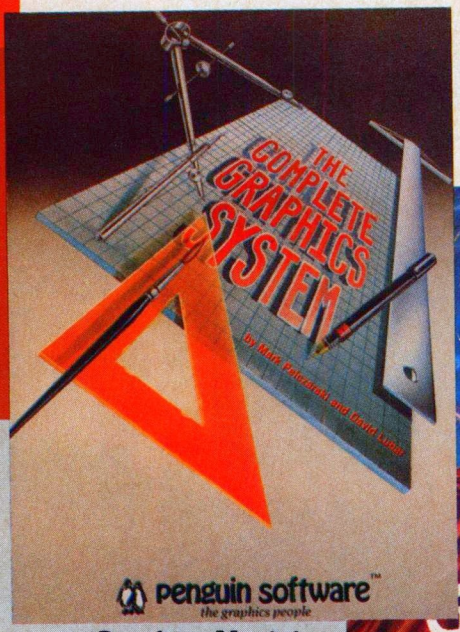


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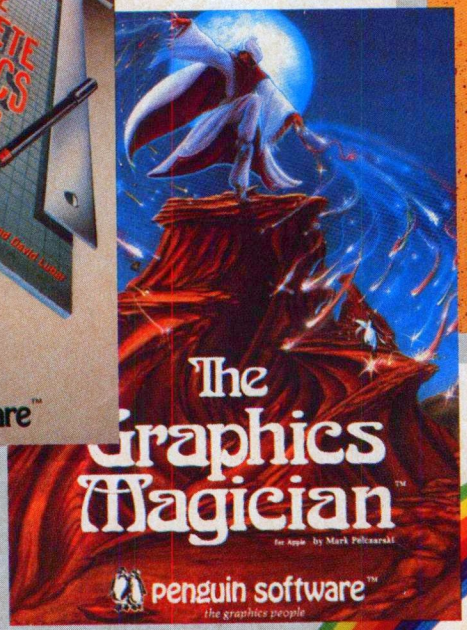


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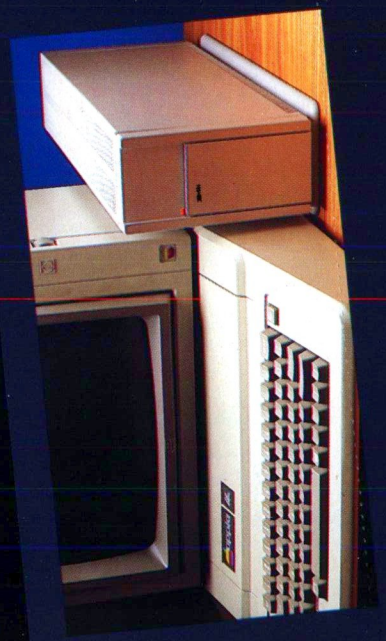

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